RURAL-TO-RURAL MIGRATION IN GUJARAT, INDIA

by

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(1975)

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE
DEGREE OF

MASTER OF CITY PLANNING

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

MAY 1977

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May 1977

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Submitted to the Department of Urban Studies and Planning on May 27,1977 in partial fulfillment of the requirements for the Degree of Master of City Planning.

ABSTRACT

This thesis has analyzed rural-to-rural male migration in the stateof Gujarat in India. The migration pattern in Gujarat is similar to that in other states of the country, with rural-to-rural migration being the predominant form of migration. We have used data from the Census of India, 1970=71, to estimate multiple regression equations for out-migration from and in-migration into the rural areas of Gujarat's nineteen districts.

The major finding of this thesis is that in-migration into a district varies positively with land productivity and rainfall, and inversely with the proportion of scheduled castes and tribes in the population and with the proportion of small farmers. Out-migration from a district, on the other hand, is associated positively with the proportion of agricultural labobers in the work force, output per hectare, proportion of area devoted to food grains crops, and negatively with the proportion of small farm households in the rural farm sector.

Based on our analysis, we suggest that further research needs to be done in the following areas in order to formulate rural development policies in Gujarat:
--identifying the extent to which cash cropping may be effective without reducing food grains production;
--analyzing the patterns of interaction among neighboring districts,
--identifying viable growth centers, and
--comparitive study of rural-to-rural and rural-to-urban migration.

We feel that whatever future research we undertake with a view to solving employment problems, it would be more meaningful to tackle the problem at the regional level rather than at the district level, given the high labor mobility across neighboring districts.

Karen R. Polenske,
Associate Professor of Regional Planning

ACKNOWLEDGEMENTS

In submitting this thesis, I must express my gratitude to Professor Karen R. Polenske for the many hours she spent in helping me through the process of research, writing, and putting the thesis in its final form.

I also owe thanks to my two readers--Professor Lisa Redfield Peattie and Professor Lloyd Rodwin--for their helpful comments and general encouragement.

Responsibility for any errors that remain is, of course, mine.

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CHAPTER I

INTRODUCTION

The process of development which brings about social, economic and political changes does not occur uniformly throughout a region. This creates many disparities among regions and among various groups of people. In the developing countries today, these disparities are most obvious between the rural and the urban sectors. The former is characterized by low incomes, few employment opportunities, and generally stagnant economy, while the latter is characterized by urban centers experiencing rapid expansion of employment opportunities and higher incomes. In response to this, large numbers of people from rural areas have begun migrating to these urban centers in the hope of improving their condition.

Most of the cities in these countries are in no position to absorb these migrants into their existing socio-economic fabric. This has created underlying pressures and tensions in the cities, and consequent concern for policy makers. One outcome of such concern is that policy makers

and researchers have begun to focus on the dynamics of rural-to-urban migration. Many studies have been made in a number of developing countries to understand this process--who migrates, why, and what factors determine the choice of destination, and so on.

The urban bias of most governments has brought about a lop-sided view of the entire migration process. We have limited our attention to rural-to-urban migration, while very little is known about other migration patterns that occur in a changing society. The case of India is a good example. Here although rural-to-rural migration is significantly larger than rural-to-urban migration, very little systematic effort has been made to understand it.

Why Study Rural-to-Rural Migration?

The purpose of this thesis is to explore some aspects of rural-to-rural migration in Gujarat, a state in western India. Why is such an exercise important? First, its magnitude is very large. According to the 1961 Census, 57 per cent of all the male migrants in India had migrated

from one rural area to another, while only 26 per cent of the male migrants were in the rural-urban category (Bose, 1973, p.144)

Female migration is even greater in magnitude, but this migration in India has traditionally been for non-economic reasons. It is mainly marriage migration and to some extent 'associational' migration. Marriage migration occurs because of village exogamy in most parts of India. In such a social structure, the female is married to a male from another village and after marriage goes to reside in her husband's village. Associational migration occurs when the female accompanies the male when he migrates for economic reasons. We assume that this holds for most female migration even today. We recognize that this is at best a broad generalization because female participation in the labor force is increasing, and, as such, migration for economic reasons has become a good possibility for them. Even so, we have restricted our analysis to male migration alone.

A second reason for studying rural-to-rural migration is that very little is known about the dynamics of long-term rural-to-rural migration. What factors determine such long-term migration? Is this migration from one depressed rural region to another slightly less depressed region? If so, what are its implications for the regions involved? What kind of socio-economic transformation of the regions can

come about if such migration continues? Answers to such questions are important in understanding the dynamics of rural change in India, which is valuablebecause in India, agriculture is still the dominant mode of livelihood and a way of life for the majority of the people and changes that take place in it are going to be of great significance for many years to come.

Scope and Methodology:

In this thesis we shall deal with two basic issues:

1. What is the pattern of lifetime, inter-district, rural-to-rural migration in Gujarat and what are some of the causal relationships underlying this pattern?

2. What are the implications of our analysis for further research which can in turn lead to policy recommendations for the development of rural Gujarat?

Our approach will be to consider in-migration and out-migration separately. We shall formulate hypotheses relating them to selected socio-economic variables. These hypotheses will then be tested empirically. The tool used for the analysis is a multiple regression model. The migration data as well as the data on the socio-economic variables are taken from the 1971 census of Gujarat, India.

We have tried to explain in-migration by the following

independent variables -- agricultural laborers as a per cent of total rural work force, amount of rainfall, land concentration ratio, output per hectare, and proportion of scheduled castes and tribes in the total rural population. On the other hand, we have considered agricultural laborers as a proportion of the total rural work force, output per hectare, proportion of gross cropped area devoted to foodgrains, and small and marginal farm households as a proportion of all farm households to explain the variation in out-migration.

In considering the second issue we note that there has been very little systematic study of rural-to-rural migration, and very few rural development strategies have explicitly tried to take this into account. The purpose of our study is, therefore, to analyze the pattern of rural-to-rural migration, and then suggest directions for future research. We will also consider the feasibility of some development strategies in the context of rural-to-rural migration. However, it is beyond the scope of our study to suggest concrete policy recommendations for the development of rural Gujarat.

The methodology which we use will naturally be influenced by the scope of our study, and the actual socio-economic conditions prevailing in the region under study.

The focus of our study is to find the pattern of migration, i.e., which rural areas attract migrants and which rural areas supply these migrants. In other words, we are

interested in identifying those characteristics which determine whether a particular rural area will attract or send migrants. We shall not confine ourselves to purely economic factors in this analysis.

Since the Harris-Todaro model (Harris and Todaro, 1970) is widely used to analyze rural-to-urban migration in developing countries, it could have provided a framework within which to analyze rural-to-rural migration in Gujarat. However, we found that it could not be adapted for our purposes. First, Harris-Todaro were trying to provide an alternative to the "bright city lights" theory of migration, but this is clearly not relevant for rural-to-rural migration. Second, the Harris-Todaro model "recognizes the existence of a politically determined minimum urban wage" (Harris and Todaro, 1970, p.126). It is this minimum wage which leads to unemployment and underemployment in urban areas. Although we find unemployment and underemployment in rural Gujarat, they are not the result of a legally determined minimum wage. As such, we cannot apply the Harris-Todaro model.

The Harris-Todaro model has been extended by Aklilu-Harris (1977) to cover the case where there is no minimum urban wage as in the case of Indonesia. Their Indonesian study examines the employment rate, the occupation structure, and the determinants of the earnings of the urban migrants. In such a situation we expect an influx of migrants to push

wages down, and the empirical findings confirm this. Aklilu-Harris find that since the migrants are willing to take jobs at very low wages, there is virtually no unemployment, but the migrants remain poor.

This may very well be the case in rural Gujarat but such an analysis is beyond the scope of our present study.

In the following section we formulate hypotheses relating the two dependent variables to the socio-economic variables.

Hypotheses of Rural-to-Rural Migration:

There are a number of hypotheses that can be set forward regarding rural-to-rural migration. Given our data constraints we are unable to test all such hypotheses. We shall therefore put forward those which our data allow us to test. We can formulate hypotheses about why a rural area of a district attracts male migrants from rural areas of other districts in the state or, conversely, about why a rural area of a given district sends male migrants to the rural areas of other districts.

Our hypotheses are that a rural area of a district is likely to attract rural migrants from other districts under the following conditions.

Cultivators with medium- and large-size holdings are

a high proportion of the rural labor force. It is hypothesized that these cultivators cannot supply all the labor necessary for agricultural operations themselves and hence need to hire wage labor thus creating an incentive for in-migration of rural agricultural labor from surrounding areas.

There is intensive land use due to the adoption of certain new labor-intensive technologies, such as the use of chemical fertilizers and extended irrigation. Such technologies act as an attracting force for rural migrant labor.

Scheduled castes and tribes form a low proportion of the rural population. It is observed that a region with a high proportion of these groups tends to be generally backward, and as such will not attract migrants from other rural areas.

These conditions are neither necessary nor sufficient. They represent independent socio-economic forces whose interaction cannot be specified a priori. It is hoped that our analysis will indicate the strong forces.

On the other hand, it is much more difficult to construct hypotheses to explain why rural areas send migrants to other rural areas. This is so because it is quite unclear as to why a displaced rural worker chooses to migrate to another rural area rather than to an urban center. One possible reason may be that push-pull forces operate

differently for different groups within the same village. For example, the poorer migrants are more likely to migrate to a nearby better-off rural area for a number of reasons. They often lack contacts in the cities. They also lack the minimum skills of being literate. These poorest of the migrants are mostly the landless laborers and members of the low castes and as such are from the lowest rungs of the socio-economic ladder in their villages. Under such circumstances, it may be less risky to migrate to another agricultural setting even if it means continuing their existence as poor laborers. On the other hand, the better-off migrants - those belonging to service castes and sons of rich farmers, have the necessary contacts and skills that enable them to migrate to a city.

However it is possible to specify some hypotheses about the characteristics of a rural area that are likely to produce high rural-to-rural migration.

Foodgrain crops dominate the cultivation in the region. This cropping pattern is associated with a low level of agricultural commercialization. It is also observed that these crops require relatively lower quantities of labor. Hence we expect such regions to have high out-migration.

The region has low land productivity. This implies that agriculture will not be able to sustain all the people

in that region. Since we do not expect significant non-agricultural employment opportunities in such regions, we expect high out-migration rates.

The proportion of small and marginal farm households* in the total rural households is low. Small and marginal farms are not usually able to provide high levels of income but due to social reasons, the rural work force prefers to be land-owning rather than being employed for wages. For this reason we expect that regions with a high proportion of small and marginal farms will have low rates of out-migration.

Our earlier comments regarding necessary and sufficient conditions are also valid for this case.

Chapter Scheme:

The next chapter will present a brief review of the hypotheses and theories regarding migration and some of the major findings of migration research. The review is important in that the theoretical approaches for studying rural-to-urban migration can also provide a framework within which to study rural-to-rural migration.

Chapter Three provides the background to rural-to-rural migration in Gujarat by looking at the general migration patterns in India. It also compares the trends in

* Generally, marginal farmers in Gujarat are those farmers with less than 2.5 acres of land, while small farmers have between 2.5 and 5 acres. Medium and large farmers operate between 5.25 acres and 25- and - above acres respectively.

Gujarat with those in the other states.

Chapter Four deals with the statistical analysis of rural-to-rural migration. In this chapter we have tried to explain in-migration into and out-migration from the rural areas of a district in terms of the above mentioned socio-economic variables in order to test our hypotheses.

In the fifth chapter we have focussed our attention on the implications of our findings for further research to help formulate strategies for rural development in Gujarat.

Finally, in Chapter Six, we present a summary of our findings and conclusions.

Conclusion:

Summarizing the discussion of this chapter, we feel that a study of rural-to-rural migration is important because of its magnitude and the limited understanding we have of it. Our study will deal with the factors that determine in-migration and out-migration and will try to explore the implications of our findings for further research. To this end, we have formulated a set of hypotheses which we shall test in Chapter Four using multiple regression analysis.

CHAPTER II

SURVEY OF MIGRATION RESEARCH*

In this chapter we present a brief overview of various hypotheses and theories regarding migration, and some general findings of migration research. Most of the past and current research on migration is directed towards understanding rural-to-urban flows. Nevertheless, it is useful to examine the body of research because some of the theoretical approaches used to study rural-to-urban migration can also provide a framework to study rural-to-rural migration.

The most striking feature of all migration studies is their diversity in terms of scale, coverage, data used, aims, and methods of research. There is no single approach. Economists, sociologists, geographers, and planners have all contributed to migration research. As a result, much of the migration research is discipline bound. Consequently, it can be categorized broadly according to the various lines of inquiry. Table 2.1 differentiates the most dominant lines of inquiry with an illustration of the principal variables that have received attention in each case. Examples of research conducted on each item have also been provided. This classification has been developed by Shaw (1975), and although the approach may be debatable, it provides a fairly good overview of the many aspects of

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*The two major works referred to in developing the framework for this chapter are Shaw (1975) and Briggs (1973).

TABLE 2.1 : DIFFERENTIATING LINES OF INQUIRY

	Lines of Inquiry	Principal Explanatory Variables	Exemplary Research
PART A: DETERMINISTIC*			
I	Migration selectivity and differentials	Age, sex	Thomas, 1958 Shryock Jr., 1964
		Marital status	Taeuber, 1966 George, 1971
		Education	Fein, 1965 Hamilton, et. al., 1965
		Occupation	Blau, et. al., 1967 Stub, 1962
		Career and life cycle	Leslie, et.al., 1961 Ladinsky, 1967a
II	Economic Aspects of Migration	Wages and salaries	Okun, 1968 Greenwood, 1968a
		Employment opportunities	Blanco, 1963 Lowry, 1966
		Cost-Benefit Model	Sjaastad, 1962 Speare, Jr., 1971a
		Factor allocation	Tarver, 1965 Gallaway, 1967
III	Spatial Aspects of Migration	Distance	Morrill, 1963 Brown, et.al., 1970e
		Directional bias	Wolpert, 1967a Lee, 1966
		Information flows	Morrill, et.al., 1967 Marble, 1963
		Intervening opportunities	Stouffer, 1960 Jansen, 1968
		Gravity model	Zipf, 1946 Claeson, 1969

TABLE 2.1 (CONT'D):

	Lines of Inquiry	Principal Explanatory Variables	Exemplary Research
IV	Behavioral Aspects of the Decision to Migrate	Place utilities	Wolpert, 1965 Brown, et.al., 1970b
		Stresses, strains	Wolpert, 1966a Lee, 1966
		Residential complaints	Rossi, 1955 Taylor, 1969
PART B: PROBABILISTIC*			
V	Migration Probabilities and the Mover-Stayer Continuum	Migration expectancy	Kuldorf, 1955 Wilber, 1963
		Recurring Intra- and Inter-regional flows	A. Rogers, 1968 Stone, 1968a
VI	Stochastic Models	Migration histories	Taeuber, et.al., 1967 Wilber, 1963
		Cumulative inertia	Myers, et.al., 1967 McGinnis, 1968 Ginsberg, 1972a

*NOTE: In the deterministic approach, a precise relationship between the migration event and the explanatory varibles is the objective. In the probabilistic approach, a statistical relationship specifying a relationship between the dependent and the independent variables within certain limits is the objective.

SOURCE: Shaw (1975), pp.13-15.

migration research.

Theoretical Approaches to the Study of Migration:

Using Shaw's classification, five broadly-defined approaches to migration theory can be identified. We shall discuss these briefly in this section.

I: Selectivity in Migration:

The knowledge that all persons do not react similarly to conditions that cause migration has generated a great deal of research in understanding the dynamics of migration selectivity. Generally, sociologists and demographers have concerned themselves in identifying and discerning the factors that differentiate the migrants from the sedentary population. Their research has focussed on such variables as age, sex, marital status, race, ethnic origin, etc.

II: Economic Aspects of Migration:

This line of research has mainly been taken up by economists. It has contributed greatly to our present understanding of the migration process. The major premise of this line of research is that people are economically rational and that they perceive migration to be an economic decision. Broadly speaking, the economic aspects of migration

have been studied in terms of three approaches: migration as a factor-allocative device, migration as a response to employment opportunities, and migration as an investment.

1) Migration as a Factor-Allocative Mechanism:

If labor is considered a factor of production, then an important issue is the extent to which migration acts as a mechanism to allocate it efficiently in the economy. To be efficiently allocated, labor would have to seek out opportunities in which its returns would be the greatest. As a result, a maximizing worker will offer his labor in the labor market with the higher wage rate. Thus, wage differentials between two places influence the decision to migrate. The competitive model of factor mobility predicts that the volume of migration to a given place j would increase as wages at j exceed those at place i. Alternatively, the push-pull hypothesis can be formulated as follows--lower levels of wage rate at the origin act as a push factor, while higher levels at possible places of destination acts as a pull factor for migration.

2) Migration as a Response to Employment Opportunities:

Another very important component of the push-pull hypothesis has to do with the levels of employment at the place of origin and the place of destination. It is hypothesized that increasing levels of unemployment at the place of origin act as a force for out-migration while

deterring in-migration. On the other hand, increasing levels of employment opportunities in a place act as an attracting force for in-migrants.

3) Migration as an Investment:

In this model, migration is treated in terms of a general investment theory. In such a framework, the individual is seen to act on the basis of a comparison of the costs and returns to migration. The costs include direct costs, such as transportation costs and other financial costs incurred by the migrant during the period of his or her job search. The indirect costs include foregone earnings while travelling, job searches, and training for the new job. The returns to migration equal the difference between the future real earnings at the destination and those that would be received at the origin without any moving.

III: Spatial Aspects of Migration:

Research on this aspect of migration has largely been led by geographers. As migration occurs in a geographic area, it is seen to be partly determined by certain spatial factors, such as distance, direction of migration flows, size of and interconnections between the origin and the destination, information flow, and intervening opportunities between alternative destinations.

Distance:

Distance serves as a measure of the cost of moving, of information flow between places, and also of the social and cultural differences between places. As such, it has long been considered a deterrent to migration. The probability of migration between any two places diminishes as the distance between them increases.

Directional Bias:

Some researchers hold that directional biases are relevant in explaining migration. Once a certain migration pattern becomes established (e.g., migration along a certain channel or migration to certain nodes), future migration will be biased towards it.

The Gravity Model:

The formulation of this model relates the gravity concept to the central place theory. According to this theory, the potential migrant chooses from a number of alternative places that can satisfy him. The destination finally chosen is the nearest satisfactory alternative. By this decision, the migrant minimizes his or her costs. According to the gravity concept, the destination chosen will also be larger in population size. The population size of a place is taken as an indicator of the number of job opportunities, amenities, etc. , available at that place

and hence as an indicator of its desirability to the migrant.

Intervening Opportunities and Competing Migrants:

This model asserts that migration from the origin to the destination is a complex function of opportunities at the destination, intervening opportunities between the origin and the destination, other migrants who may be competing for these opportunities at the destination and distance.

IV: Behavioral Aspects of the Decision to Migrate:

All the above approaches to migration research deal with the 'why' and 'who' of migration. They seek to explain migration as determined by factors which lie outside the control of the individual. They have no doubt extended our understanding of the migration process, but the sociologists and behavioral theorists believe they have overlooked an important dimension of the issue--the very decision-making process of the migrants. The above approaches, especially that of the economists, have been to infer motives from a study of objective structural determinants and then to impute these motives to the migrants. The sociologists believe that such an approach ignores the differential perception and evaluation and puts too much emphasis on rational behavior. As a result, these researchers have resorted to subjective accounts by the

migrants of their motives, perception, and decision-making regarding migration.

V: Probabilistic and Stochastic Approaches to Migration:

This line of research is relatively new and is in direct contrast with the deterministic approach to the migration process. The inherent uncertainty of migration due to the unpredictable nature of human behavior means that its future cannot be predicted with certainity, but only in probabilistic terms. Therefore, many researchers feel that the dynamics of migration can best be explained in such terms. A stochastic model results when probability distributions are introduced into the model in place of mathematical variables, and equations in the model include random variables. Probabilities are then attached to the various possible future migration events. Such models are predictive and are used to forecast the consequences of migration in population distribution.

A Summary of General Findings of Migration Research:*

We present here some of the more generally accepted and coroborrated findings of migration research in the developed as well as the developing world. The findings are presented here by different lines of inquiry about migration. Both the

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*Shaw (1975), pp.133-136

reviews referred to in this chapter support these findings.

I: Findings Regarding Selectivity in Migration:

--Younger persons, in their late teens, twenties, and early thirties have a greater propensity to migrate than those in other age groups. The explanation given for this observed tendency is that younger persons have fewer ties with the place of origin and as such may be readier to break them to take advantage of new opportunities. They are also more adaptable to new situations.

--Migration is not particularly selective to sex.

--Migration is postively related to educational attainment.

--Those in professional and managerial occupations are more prone to migrate than their counterparts. The more skilled also tend to migrate longer distances than the unskilled.

--Rural inhabitants with personal contacts (friends, relatives) in the city are more likely to migrate to it.

II: Findings Regarding Economic Aspects of Migration:

--Economic motives (e.g., employment opportunities, wage differentials) are an important determinant of migration.

--Increasing income at the destination exerts a greater influence on migration to it from the place of origin in the form of a pull than does decreasing income at the origin as a push.

--Rising unemployment levels at the origin stimulates out-migration, while it deters in-migration in possible places of destination. Generally, rising unemployment levels at the origin exerts a greater push factor than does rising unemployment at the destination as a deterrent to in-migration.

--High rates of rural-to-urban migration are associated with the transformation of a society from a rural and agricultural economy to an urban, industrial one.

--Cost-benefit models may not be appropriate to explain migration, because of the uncertainity that a person is aware of and able to calculate the costs and the returns to mobility or immobility.

--A potential migrant's ability to weigh migration costs and returns varies directly with his or her

educational attainment combined with his or her awareness of the possible existing alternatives.

III: Findings Regarding Spatial Aspects of Migration:

--Distance acts as a deterrent to migration. The greater the distance between any two places, the smaller will be the migratory flow between them.

--Directional biases in migration are crucial to explain a given pattern of migration.

IV: Findings Regarding Probabilistic Approach:

--The population that is likely to migrate can be probabilistically classified into three mobility profiles: (a) the chronic movers, with a high and frequent degree of mobility; (b) the movers, with a low degree of mobility over time; and (c) the stayers, with little or no mobility over time.

Most of the above findings are based on rural-to-urban migration. Further research is required to find out whether they are valid for rural-to-rural migration as well.

Present Migration Research and its Relevance to Rural-to-Rural Migration:

Although research on migration is abundant and diverse, it deals with basically only one pattern of migration--that

of rural-to-urban migration. A limited research has been done in the area of urban-to-urban movements also, but there is no single systematic study on rural-to-rural migration. We have already pointed out in Chapter I why such research is important. The theoretical approaches discussed here can also serve as a framework for studying rural-to-rural migration. The focus should be to get a comparative understanding of rural-to-rural and rural-to-urban migration. Why do some persons prefer to migrate to urban areas, while others prefer to migrate to rural areas? Are the attributes of the former group any different than those of the latter? Which spatial and economic factors determine rural-to-rural migration? Is rural-to-rural migration a phenomenon of general underdevelopment, and, if so, will it diminish as development occurs?

Conclusion:

This survey of migration research is important for the present study because although the theories and hypotheses discussed here have been formulated to understand rural-to-urban migration, they can also be listed in the context of rural-to-rural migration. Such an exercise can give us a comparative understanding of the two processes, which is essential if we have to understand either one fully. Our own study is an attempt to discern some causal factors of rural-to-rural migration in Gujarat.

CHAPTER III

INTERNAL MIGRATION IN INDIA

In this chapter, we shall first discuss the general patterns of internal migration in India as a whole and then look at the patterns in Gujarat. We are interested in knowing how the patterns in Gujarat compare with the patterns in other states. A closer look at the migration pattern throughout India is also important because it can provide us with a wider context within which to understand the specific pattern of rural-to-rural migration in Gujarat.

Migration Patterns in India:

Since Independence, the study of internal migration has gained great significance in India. This is due to the fact that such migration is related to the process of change and is often in response to regional disparities in development. In view of the objective before the country--that of lessening such disparities among regions and communities--the concern with migration becomes important.

The volume of internal migration in India as computed by Kingsley Davis does not seem very large, as seen from Table 3.1.

TABLE 3.1 : INTERNAL MIGRATION IN INDIA

Census Year	Percent of persons enumerated in a state or province different from the one in which they were born to the total population
1891	3.8
1901	3.3
1911	3.6
1921	3.7
1931	3.6
1951	3.0
1961	3.3

SOURCE: Bose (1973), p.142

Migration here is defined as occurring across state boundaries. But Bose points out that if we consider movements within a state as migration and migrants as those persons who were born outside the place of enumeration, the magnitude of migration jumps considerably. According to this definition, the percentage of migrants to total population in 1961 was 30.7, which means that about a third of the total population was mobile. (Bose, 1973, p.142) This high proportion is caused largely by female migration. This migration is mainly 'marriage migration' and 'associational migration' as pointed out in Chapter I. Economic causes per se are unimportant in explaining female migration. Even in big cities, only a small proportion of the total female migrants work, as can be seen in Table 3.2.

TABLE 3.2 : PERCENT OF FEMALE MIGRANTS WHO WORK IN MILLION-PLUS CITIES, 1961

Cities	Percent
Greater Bombay	10.9
Calcutta	9.7
Delhi	5.7
Madras	8.5
Ahmedabad	7.0
Hyderabad	16.8
Bangalore	13.4
Kanpur	4.2

SOURCE: Bose (1973), p.142

Using the 1960-61 Census data, Ashish Bose has identified the nature of lifetime migration patterns in India in terms of the origin, direction, distance and volume. He has isolated three types of migration related to distance and movement of people. (1) Short distance migration: This is intra-district migration. Migrants are born outside the place of enumeration but within the district of enumeration. (2) Medium-distance migration: Migrants are born outside the district but within the state. This is inter-district but intra-state migration. (3) Long-distance migration: This is inter-state migration. Migrants are born in states other than the state of enumeration. The relative shares of each of these categories of migration is given in Table 3.3.

The table indicates that a little over half of the male migration and about three-fourths of the female migration

TABLE 3.3 : PERCENT OF TOTAL MIGRANTS BY MIGRATION TYPE

Migration Type	Total	Male	Female
Short distance	67.8	54.4	73.8
Medium distance	21.4	26.8	19.0
Long distance	10.8	18.8	7.2
Total	100.0	100.0	100.0

SOURCE: Bose (1973), p.143

is over a short distance. In the case of medium- and long-distance migration, male migration predominates.

Bose has further indicated four migration streams or flows based on migration by place of birth and place of residence and rural/urban breakdown. The flows are classified as follows: (i) rural-to-rural; (ii) rural-to-urban; (iii) urban-to-rural; and (iv) urban-to-urban. Analysis of the 1960-61 data shows that the predominant form of migration in India is rural-to-rural female migration. Even in the case of males, rural-to-rural migration accounts for over half of the total migration. In the other types of migrations, male migration dominates. (Bose, 1973, p.144) These data are shown in Table 3.4.

When we consider distance and rural/urban flows simultaneously, it is found that in the case of males, rural-to-rural migration accounts for the largest number of

TABLE 3.4 : PERCENT OF TOTAL MIGRANTS BY MIGRATION STREAMS

Migration Stream	Total	Male	Female
Rural-rural	73.7	56.7	81.3
Rural-urban	14.6	25.7	9.7
Urban-urban	8.1	13.0	5.8
Urban-rural	3.6	4.6	3.2
Total	100.0	100.0	100.0

SOURCE: Bose (1973), p.144

migrants over short and medium distances. Rural-to-urban migration becomes more important only in the case of long-distance migration. On the other hand, female migration, regardless of distance, is mostly rural-to-rural in nature. This analysis clearly shows that even if we confine ourselves to male migration alone, rural-to-rural migration is very significant. 56.7 per cent of all male migration is of rural-to-rural type, while only 25.7 per cent is from rural areas to urban areas. (Table 3.5)

Kshirsagar in another study using the same data has studied the pattern of male migration in India for the period between 1951 and 1961. She has outlined the patterns for each of the then fifteen states. We shall briefly summarize her findingshere as they contribute to our understanding of the pattern of internal migration in India. In 1961, the total male population of the fifteen states was

TABLE 3.5 : LIFETIME MIGRATION STREAMS: PERCENTAGE DISTRIBUTION

Migration Stream	Total	Male	Female
I. Short distance			
a. Rural-rural	57.7	40.2	65.5
b. Rural-urban	6.1	9.0	4.8
c. Urban-urban	2.1	3.0	1.7
d. Urban-rural	2.0	2.3	1.8
Sub-total	67.9	54.5	73.8
II. Medium distance			
a. Rural-rural	12.1	11.3	12.5
b. Rural-urban	4.9	8.8	3.2
c. Urban-urban	3.3	5.2	2.5
d. Urban-rural	1.1	1.5	1.0
Sub-total	21.4	26.8	19.2
III. Long distance			
a. Rural-rural	4.0	5.3	3.4
b. Rural-urban	3.6	7.8	1.8
c. Urban-urban	2.7	4.9	1.7
d. Urban-rural	0.5	0.8	0.4
Sub-total	10.8	18.8	7.3
Grand Total	100.0	100.0	100.0

SOURCE: Bose (1973), p.144

222 million, out of which 40 million or 18 per cent was classified as migrants. More than half of these, some 25 million or 11.2 per cent,were migrants during the period 1951-61. Of these, more than 80 per cent were intra-state migrants. (Tables 3.6 and 3.7)

If we take a look at the intra-state flows, shown in Table 3.8, we find that intra-district movement is the more

TABLE 3.6 : MALE MIGRANTS IN VARIOUS STATES IN INDIA, 1951-1961

State	Male population in 1961 (Millions)	Male migrants (in millions)	Male migrants as percent of male population
Andhra Pradesh	18.16	2.49	13.7
Assam	6.33	0.76	12.1
Bihar	23.30	1.67	7.2
Gujarat	10.63	1.33	12.5
Jammu & Kashmir	1.90	0.13	6.8
Kerala	8.36	1.04	12.5
Madhya Pradesh	16.57	2.23	13.4
Madras	16.91	2.08	12.3
Maharashtra	20.43	3.73	18.2
Mysore	12.04	1.88	15.6
Orissa	8.77	0.70	8.0
Punjab	10.89	1.29	11.8
Rajasthan	10.56	0.76	7.2
Uttar Pradesh	38.63	2.60	6.7
West Bengal	18.60	2.17	11.7
All-India	222.08	24.86	11.2

SOURCE: Kshirsagar (1973), p.164

dominant. It accounts for 65 per cent of the total intra-state migration. There do exist variations from state to state. In the case of Punjab, for example, about 50 per cent of the intra-state migration occurs between the districts. On the other hand, in Assam and Orissa, inter-district migration is as low as 23 per cent of the total intra-state migration.

Breaking up total migration into the four flows (rural-

TABLE 3.7 : INTER-STATE AND INTRA-STATE MALE MIGRATION IN INDIA, 1951-61

State	Total Male Migrants (in millions)	Percentage distribution to total male migrants	
		Interstate	Intrastate
Andhra Pradesh	2.49	7.0	93.0
Assam	0.76	26.1	73.9
Bihar	1.67	13.6	86.5
Gujarat	1.33	15.5	84.5
Jammu & Kashmir	0.13	10.5	89.5
Kerala	1.04	7.7	92.3
Madhya Pradesh	2.23	22.7	77.3
Madras	2.08	9.5	90.5
Maharashtra	3.73	23.2	76.8
Mysore	1.88	20.1	80.0
Orissa	0.70	13.3	86.7
Punjab	1.29	19.7	80.3
Rajasthan	0.76	21.0	79.0
Uttar Pradesh	2.60	10.3	89.7
West Bengal	2.17	43.5	56.6
All-India	24.86	18.4	81.6

SOURCE: Kshirsagar (1973), p.165

to-rural, rural-to-urban, urban-to-urban, and urban-to-rural) in Table 3.9, we find that of the total 24.86 million male migrants, 13.77 million migrated from one rural area to another, 6.39 million migrated from rural to urban areas, 3.33 million migrated from one urban area to another urban area, and 1.32 million migrated from urban areas to rural areas. So, as seen earlier, more than half of the total movement is within rural areas while only about a fourth of it is from rural to urban areas. These proportions vary from state to state. On the one hand, there are states like

TABLE 3.8 : INTRA-STATE MIGRATION OF MALES, 1951-61

State	Migrants within the state (in millions)	Percentage distribution	
		Intra-district	Inter-district
Andhra Pradesh	2.32	70.7	29.3
Assam	0.56	76.8	23.2
Bihar	1.44	65.3	34.7
Gujarat	1.12	62.5	37.5
Jammu & Kashmir	0.12	58.3	41.7
Kerala	0.96	67.7	32.3
Madhya Pradesh	1.72	71.5	28.5
Madras	1.88	67.6	32.5
Maharashtra	2.87	60.3	39.7
Mysore	1.50	69.3	30.7
Orissa	0.60	76.7	23.3
Punjab	1.04	51.0	49.0
Rajasthan	0.60	65.0	35.0
Uttar Pradesh	2.33	54.1	45.9
West Bengal	1.23	63.4	36.6
All-India	20.29	64.6	35.4

SOURCE: Kshirsagar (1973), p.167

Assam, Kerala, and Orissa, where 70-80 per cent of the migration is between rural areas, while at the other extreme there are states like Madras, Maharashtra, Gujarat, and West Bengal, where rural-to-rural migration accounts for about 44-46 per cent of the total migration.

Rural-to-rural migration most commonly occurs within a particular state. About 68 per cent of it was within the same district, while 22 per cent was inter-district in nature, i.e., more than 90 per cent of rural-to-rural migration is intra-state. About 8 per cent of the flow is between

TABLE 3.9 : FOUR FLOWS OF MALE MIGRANTS IN VARIOUS STATES ACCORDING TO RURAL/URBAN CHARACTERISTICS, 1951-61

State	Total Male Migrants (millions)	Percentage distribution			
		Rural-Rural	Urban-Rural	Rural-Urban	Urban-Urban
Andhra Pradesh	2.49	60.3	5.6	24.1	9.9
Assam	0.76	80.1	1.8	13.5	4.4
Bihar	1.67	64.9	2.5	25.5	6.9
Gujarat	1.33	46.3	7.3	29.3	17.1
Jammu & Kashmir	0.13	63.2	5.9	17.3	13.5
Kerala	1.04	73.0	7.8	12.9	6.2
Madhya Pradesh	2.23	63.7	5.4	18.2	12.6
Madras	2.08	44.8	7.9	28.6	18.7
Maharashtra	3.73	44.9	6.3	30.9	17.8
Mysore	1.88	56.7	6.5	21.6	14.9
Orissa	0.70	73.7	3.0	15.0	8.2
Punjab	1.29	52.3	4.9	29.2	13.6
Rajasthan	0.76	56.5	6.3	21.8	15.2
Uttar Pradesh	2.60	55.2	4.2	26.5	13.9
West Bengal	2.17	45.0	3.1	37.6	14.2
All-India	24.86	55.4	5.3	25.7	13.4

SOURCE: Kshirsagar (1973), p.169

contiguous states and less than 2 per cent from other states. Similar analyses of rural-to-urban migration flow indicated that 36 per cent of this flow was intra-district, another 36 per cent of it was inter-district, 18 per cent was between contiguous states, and 10 per cent was from other states. In contrast to rural-to-rural migration, only 72 per cent of the rural-to-urban migration was intra-state in nature. This shows that rural-to-urban migration tends to be more long-distance in nature than rural-to-rural migration. The variations among states in these general trends can be

TABLE 3.10 : MALE MIGRANTS IN RURAL POPULATION AND RURAL-TO-RURAL FLOW, 1951-61

State	Rural Male Population (millions)	Migrants (in millions) and their % to rural pop.	Rural-to-Rural migrants (in millions)	Percentage distribution of rural-to- rural migrants			
				Intra-District	Inter-District	from contiguous States	from other States
Andhra Pradesh	14.95	1.64/11.0	1.51	76.9	2.2	2.1	1.1
Assam	5.78	0.62/10.8	0.61	62.2	15.1	15.1	6.5
Bihar	21.14	1.13/ 5.3	1.09	67.7	7.8	7.8	0.9
Gujarat	7.83	0.71/ 9.0	0.62	69.3	23.4	5.8	1.5
Jammu & Kashmir	1.57	0.09/ 5.6	0.08	61.0	31.7	6.1	1.2
Kerala	7.08	0.84/11.9	0.76	66.5	27.5	5.7	0.3
Madhya Pradesh	14.08	1.54/10.9	1.42	69.8	18.1	11.1	1.0
Madras	12.33	1.10/ 8.9	0.93	79.7	16.4	2.8	1.1
Maharashtra	14.23	1.91/13.4	1.67	73.6	20.4	5.0	1.0
Mysore	9.29	1.19/12.8	1.06	66.5	19.6	10.7	3.2
Orissa	8.16	0.53/ 6.5	0.51	75.8	16.2	5.7	2.3
Punjab	8.64	0.74/ 8.5	0.67	53.9	33.9	10.3	1.9
Rajasthan	8.82	0.47/ 5.4	0.43	60.7	21.5	17.1	0.7
Uttar Pradesh	33.40	1.54/ 4.6	1.43	62.4	31.7	5.2	0.7
West Bengal	13.58	1.04/ 7.7	0.98	60.0	14.1	21.8	4.1
All-India	180.88	15.09/ 8.3	13.77	68.4	21.7	8.2	1.7

SOURCE: Kshirsagar (1973), p.170

TABLE 3.11 : MALE MIGRANTS IN URBAN POPULATION AND RURAL-TO-URBAN FLOW, 1951-61

State	Urban Male Population (millions)	Migrants in urban pop. (millions) and % to male urban pop.	Rural-to-Urban Migrants (Milions)	Percent distribution of rural-to-urban migrant			
				Intra-District	Inter-District	from contiguous states	from other states
Andhra Pradesh	3.22	0.85 / 26.3	0.60	54.6	36.8	3.0	5.7
Assam	0.54	0.14 / 25.2	0.10	34.0	18.5	27.2	20.4
Bihar	2.16	0.54 / 25.1	0.43	37.2	45.0	13.4	4.5
Gujarat	2.81	0.62 / 22.0	0.39	42.7	36.5	12.1	8.7
Jammu & Kashmir	0.32	0.04 / 12.5	0.02	45.5	40.9	9.1	4.6
Kerala	1.28	0.20 / 15.4	0.13	56.0	35.1	6.7	2.2
Madhya Pradesh	2.49	0.69 / 27.5	0.41	36.5	22.9	33.3	7.4
Madras	4.58	0.98 / 21.5	0.60	53.8	34.8	8.2	3.2
Maharashtra	6.21	1.81 / 29.3	1.15	24.9	38.7	15.8	20.6
Mysore	2.75	0.68 / 24.9	0.41	46.8	27.1	22.9	3.2
Orissa	0.61	0.16 / 26.2	0.10	44.2	31.7	12.5	11.5
Punjab	2.26	0.55 / 24.4	0.38	29.0	43.1	21.6	6.4
Rajasthan	1.74	0.28 / 17.9	0.16	47.9	32.1	17.6	2.4
Uttar Pradesh	5.23	1.05 / 20.1	0.69	35.3	53.0	9.2	2.6
West Bengal	5.02	1.12 / 22.4	0.82	13.2	21.3	44.8	20.7
Total	41.22	9.71 / 23.6	6.39	36.1	35.6	18.4	10.0

SOURCE: Kshirsagar (1973), p.173.

TABLE 3.12 : NET BALANCE OF INTER-STATE MALE MIGRATION-- FOUR FLOWS, 1951-61 (in '000s)

State	Rural-to-Rural	Urban-to-Rural	Rural-to-Urban	Urban-to-Urban	Total
Andhra Pradesh	-38.0	-1.0	-55.0	-19.0	-113.0
Assam	+112.0	+0.5	+38.0	+4.0	+154.5
Bihar	-219.0	+0.8	-292.0	-46.0	-556.2
Gujarat	+25.0	+8.0	-8.0	-19.0	+6.0
Jammu & Kashmir	-2.0	+0.2	-11.0	-5.0	-17.8
Kerala	-15.0	-6.0	-113.0	-82.0	-216.0
Madhya Pradesh	+108.0	+20.0	+114.0	+85.0	+327.0
Madras	-85.0	-8.0	-58.0	-35.0	-186.0
Maharashtra	+21.0	+0.5	+350.0	+218.0	+589.5
Mysore	+85.0	+10.0	+31.0	+9.0	+135.0
Orissa	-31.0	+0.1	-48.0	+2.0	-76.9
Punjab	-34.0	+2.0	-3.0	-25.0	-60.0
Rajasthan	-24.0	-3.0	-88.0	-30.0	-145.0
Uttar Pradesh	-106.0	-11.0	-370.0	-100.0	-587.0
West Bengal	+192.0	-4.0	+501.0	+86.0	+775.0

SOURCE: Kshirsagar (1973), p.176

seen from Table 3.10 and Table 3.11.

Considering the net balance of inter-state migration, we can identify states that attract more migrants than they send out or vice versa. The above table (Table 3.12) gives a summary of the net balance of inter-state migration for each of the fifteen states in the country. The states with a net positive balance during 1951-61 were Maharashtra, West Bengal, Gujarat, Mysore, Madhya Pradesh, and Assam. The states with net negative balances were Madras, Punjab, Andhra Pradesh, Kerala, Jammu and Kashmir, Rajasthan, Uttar Pradesh, Bihar, and Orissa. Of these states, Maharashtra, West Bengal,

and Gujarat are the most industrialized and urbanized while Uttar Pradesh and Bihar are the most underdeveloped. If we look at the net balance for each of the four flows (also in Table 3.12), we find that the urban areas of Maharashtra and West Bengal attract the largest number of rural migrants from other states. This is obviously because Bombay and Calcutta, the two major cities of India, are located in these two states. The rural areas of West Bengal also attract the largest number of rural migrants from other states. Rural and urban areas of other states that act as magnets for rural migrants are Madhya Pradesh, Assam, and Mysore. The biggest losers are the urban as well as the rural areas of Bihar and Uttar Pradesh, the two poorest states in the country. In Gujarat, both the tendencies, in-migration and out-migration almost balance each other out. But the rural pull is positive and somewhat stronger than the urban.

This pattern does indicate that the more developed regions, both urban and rural, act as attracting forces for rural migrants. In many instances, as in the case of Gujarat and Mysore, the rural areas have acted as the stronger attracting force. On the whole, the urban-to-rural flow is not very important, but it is interesting to note that the rural pull of Madhya Pradesh and Gujarat is strong enough to attract a considerable number of migrants from even the urban areas of other states.

So far we have only outlined the general pattern of migration in India as it emerged from the 1960-61 Census. Little has been said regarding such factors as the determinants and the consequences of migration. Michael Greenwood has attempted to analyze the various determinants of labor mobility in India using the 1960-61 Census data. Similar studies have been conducted by Beals, Levy, and Moses for Ghana; Greenwood for Egypt; and Sahota for Brazil. Five variables were selected to explain the inter-state migration in India. These variables were distance, population size, income, urbanization level, and educational level between the send and the receiving regions. These variables were found to explain a fairly large percentage of the variation in inter-state migration.

The distance variable is very important in explaining much of this migration. It is believed that the deterring effect of distance may be greater in India than in the other countries studied. This may very well be due to the fact that linguistic and cultural differences between regions are more marked in India than in Ghana, Egypt, or Brazil.

With regard to the income variable, the results show that migrants in India indeed tend to migrate from low-income to high-income states, a finding which is also true for Ghana, Egypt, and Brazil.

The population variable shows an interesting result.

The migration tends to be away from and to populous states. This is because,when other factors are held constant, the greater the population of the sending region, the greater is the number of persons who are likely to migrate away from it; and the greater the population of the receiving region, the larger is the number of persons who are likely to migrate to it. Large population at the origin may be indicative of population pressure there, but the tendency to again move to populated regions may be due to the fact that the large population size of the destination reflects the size of the labor market there and this in turn reflects the greater number of job opportunities that exist there.

With regard to the urbanization variable, the results of the analysis suggest that the degree of urbanization of the destination region is not very important in the decision to migrate. It appears that the degree of urbanization at the origin is more important in explaining migration.The migration tends to be away from states that are already heavily urbanized and those that are urbanizing slowly. It tends to be towards those states which are currently in the process of rapid urbanization. This result seems logically valid as regions in the process of rapid urbanization are more likely to create employment opportunities at a faster rate.

Finally, the education variable indicates first that in India the propensity to migrate does increase with

better education, unlike the situation in the other three countries. Second, the migrants also tend to go to places that have, in general, a relatively higher level of educational achievement than their place of origin. This second finding is, however, found to be true also in the case of Ghana, Egypt, and Brazil.

Another very important aspect of migration is the understanding of its consequences and implication for the sending and the receiving regions. The neoclassical economists have long argued that regional imbalances in incomes should be remedied by the process of inter-regional migration, as long as no barriers to migration exist. This process goes on until the migrant knows that nothing is to be gained by further moving. By moving from a depressed region to an affluent one, they have raised the income level of the depressed region and depressed that of the destination. Finally, this process leads to a state of equilibrium among regions when the returns to labor requiring the same effort and ability will be equal in all regions.

The study by Piplai and Majumdar raises some doubts regarding this assumption. They suggest that very often in India, both the in-migration and out-migration regions suffer from similar kinds of problems like underemployment and overpopulation. The labor that out-migrates from the home state is usually a very small proportion of the surplus labor.

As such, this movement hardly changes the existing under-employment situation in that region. Further, this movement of labor is not usually accompanied by a corresponding movement of capital. Hence, there is hardly any stimulating effect on the productivity and the per capita income level of the receiving region. The belief that in-migrants depress wages also seems to be a myth that is disappearing because in-migrants often do not even have the access to the high-wage or organized sector. Given such a situation, there does not seem to be a perceptible regional change that occurs directly as a consequence of migration at least in the short run. The change, if any, is at the level of the individual migrants.

Summarizing the migration process in India, we find that rural-to-rural migration dominates the picture--very much so in the case of female migration but also in the case of male migration. This migration is predominantly intra-district in nature. In the case of inter-state migration, it is observed that the largest flow is between contiguous states. This suggests that there is a positive relationship between spatial proximity and the volume of migration. Michael Greenwood's study shows that this is true and also that inter-state migration in India can be explained to a large extent by other variables, such as population size, urbanization, incomes, and the general education level of both the sending and the receiving regions. The socio-

economic implications of such inter-state migration in India may not be quite so optimistic as neoclassical economists would have us believe. Piplai and Majumdar suggest that such migration may not improve the existing economic situation, either in the state of origin or in the state of destination, because both regions often suffer from similar problems of underemployment and overpopulation.

Migration Patterns in Gujarat:

Kshirsagar's analysis, referred to earlier, indicates that in Gujarat for the period between 1951 and 1961, about 22 per cent of the urban males were migrants, while this was true of only 9 per cent of the rural male population. In absolute numbers, these percentages translate into 0.62 million male migrants in the urban population and 0.71 million male migrants in the rural population. Of the 0.71 million migrants in the rural areas, 92.7 per cent or 0.66 million were from other rural areas within the state, 5.8 per cent were from rural areas of the bordering states, and 1.5 per cent were from rural areas of other states. Similarly, of the 0.62 million male migrants in the urban areas, 79.2 per cent (i.e., 0.49 million) were from rural areas within Gujarat, 12.1 per cent were from the rural areas of bordering states, and 8.7 per cent were from the rural areas of other states. So, in Gujarat, of the males who

leave rural areas as migrants, 57 per cent go to other rural areas within the state, while only 43 per cent migrate to the urban areas of the state. It is also seen from these data that whereas 7.3 per cent of the rural-to-rural migration is inter-state, a higher proportion, 20.8 per cent, of the rural-to-urban migration is such.

In 1960-61, total male population of Gujarat was 10.63 million. Of these, 12.5 per cent were migrants. Of these migrants, 15.5 per cent were inter-state migrants while 84.5 per cent were intra-state migrants. A little more than 66 per cent of the inter-state migrants into Gujarat were from the bordering states of Maharashtra, Madhya Pradesh, and Rajasthan. Of the total intra-state migrants, 62.5 per cent were migrants within the same district, while 37.5 per cent were inter-district migrants.

Classification of the various migratory flows shows that of the total male migration between 1951 and 1961, 46.3 per cent was from one rural to another rural area, 29.3 per cent was from rural to urban areas, 17.1 per cent was from urban to other urban areas, and 7.3 per cent was from urban to rural areas. Similar analysis for other states shows that as the percentage of rural-to-rural movement increases, the percentage contribution of rural-to-urban and urban-to-urban flows decreases. As seen from Table 3.13, Gujarat falls in the first category of states which have a relatively high

TABLE 3.13 : PATTERN OF MIGRATION IN INDIA, 1951-61

Group	States	Percentage distribution			
		Rural-Rural	Urban-Rural	Rural-Urban	Urban-Urban
I	Madras, Gujarat, West Bengal, Maharashtra	44-46	3-8	28-38	14-19
II	Punjab, Uttar Pradesh, Mysore, Rajasthan	52-57	4-7	21-29	13-16
III	Andhra Pradesh, Jammu & Kashmir, Madhya Pradesh, Bihar	60-65	2-6	17-25	6-14
IV	Assam, Kerala, Orissa	70-80	1-8	12-15	4-9

SOURCE: Kshirsagar (1973), p.168

proportion of rural-to-urban migration.

Rural Gujarat had a net positive balance of male inter-state migrants both from rural as well as urban areas of other states. This was pointed out earlier in the chapter. This suggests that the rural areas of Gujarat seem to have a fairly strong 'pull' force. The urban areas, on the other hand, seemed to have had a net loss of male migrants to other states.

To better understand the pattern of migration in Gujarat, it is necessary to know the specific characteristics

of the region. Appendix B gives a brief introduction to some characteristics of the state--its physical configuration, distribution of its rainfall, its land use and agriculture, and spatial distribution of its industries. These are no doubt relevant factors in understanding why some areas in the state attract migrants while some deter them. A vast desert expanse in the north-west, for example, indicates that there will not be much movement into this area. Similarly, hilly regions may be a deterrent to any migration.

Conclusion:

In general then, migration in Gujarat follows the same pattern as in the country. Rural-to-rural migration is predominant within the state. The data also suggest that although rural-to-rural migration is the most important flow within the state, it is not quite as high as in some other states, such as Assam, Kerala, and Orissa, where it accounts for between 70-80 per cent of total migration. This may very well be due to the greater industrialization and urbanization in the state. In the next chapter, we shall try to establish what factors may be causing inter-district rural-to-rural male migration in Gujarat.

CHAPTER IV

AN ANALYSIS OF INTER-DISTRICT RURAL-TO-RURAL MALE MIGRATION IN GUJARAT

In this chapter, we present the analysis of inter-district, rural-to-rural migration in Gujarat. We shall test the hypotheses set forth in chapter I. The tool used for the analysis is a multiple regression model. There are two dependent variables the study tries to explain in terms of a selected number of independent variables. The independent variables chosen to explain in-migration are agricultural laborers as a proportion of the total rural work force, amount of rainfall, land concentration ratio, output per hectare and proportion of scheduled castes and tribes in the total rural population. The variables selected to explain out-migration include agricultural laborers as a proportion of the total rural work force, output per hectare, proportion of gross cropped area devoted to foodgrains, and small and marginal farm households as a proportion of all farm households.

The results of the analysis are presented under two headings — the results of the correlation analysis and the results of the regression analysis. The resultant relationship between the dependent and the independent variables are examined in some depth.

TABLE 4.1 : CORRELATION MATRIX

	IMG	OMG	AGLAB	CASTE	RAIN	CONC	OUTPH	FOODG	SFARM
IMG	1.00								
OMG	0.29	1.00							
AGLAB	0.36	0.50	1.00						
CASTE	-0.15	-0.08	0.49	1.00					
RAIN	0.48	0.04	0.34	0.44	1.00				
CONC	0.26	0.05	0.48	0.51	0.31	1.00			
OUTPH	0.14	0.10	0.02	-0.06	0.02	-0.20	1.00		
FOODG	-0.30	-0.11	-0.24	0.13	-0.30	0.36	-0.53	1.00	
SFARM	0.15	-0.27	0.26	0.53	0.19	0.57	0.15	0.25	1.00

Definitions of variables:

IMG = In-migrants as a percentage of total rural work force
OMG = Out-migrants as a percentage of total rural work force
AGLAB = Agricultural laborers as a percentage of total rural work force
CASTE = Scheduled castes and tribes as a percentage of total rural population
RAIN = Rainfall (annual) in millimetres
CONC = Land concentration ratio
OUTPH = Gross value of output per hectare for all crops (in Rupees)
FOODG = Percentage of gross cropped area devoted to foodgrains
SFARM = Small and marginal farms as a percentage of all farms

Results:

Correlation Analysis:

The correlation matrix shows the product-moment correlation between any two variables under study. The product-moment correlation measures the degree of association between the two varibles, and ranges from -1 to +1, with the value of zero indicating no association between the variables and the value of unity indicating complete association. The measure is limited in that it can capture only linear relationships. It is most useful in discovering which of a large number of variables are most closely related to a given dependent varible and which of the independent variables are multicollinear. It is therefore a useful prelude to regression analysis. By itself, however, it does not imply any causal relationship between the variables.

The matrix of intercorrelation between dependent and independent variables in presented in Table 4.1. The result of the analysis shows that IMG is related positively with the independent variables AGLAB, RAIN, CONC, OUTPH, and SFARM. On the other hand, OMG too is related postively with these, with the exception of SFARM. The remaining two variables, CASTE and FOODG, are both related negatively with the two dependent variables. Given our hypotheses, we expected to find the following relationships between the indpendent and the dependent variables.

AGLAB

Agricultural laborers are landless and they derive their livelihood by selling their labor. The agricultural laborers in many parts of Gujarat are relatively free and mobile. They are found to be casual workers, attached workers or share croppers depending on the availability of employment opportunities. It has been observed in several cases that these laborers prefer agricultural work to non-agricultural work.

If agricultural laboers are a high proportion of the rural work force, there is already a potential supply of labor within the district and so in-migration of outside labor becomes unnecessary. But instead of the expected negative relationship between AGLAB and IMG, the correlation analysis shows a positive relationship. This could be explained in two ways. First, our data relate to historical, lifetime migration. Since most of the migrants are landless laborers, a steady inflow of in-migrants into a rural area increases the share of agricultural labor in the total rural work force. In other words, a high value of AGLAB in a district may be partially the result of a high value of IMG, which implies a possible positive relationship between the two variables. Second, the local laborers show a definite preference for certain kinds of jobs so that a demand for any other kind of labor has to be met by outside labor. We thus have instances where the local labor is abundant

but there is also a high incidence of in-migration.

AGLAB, however, shows the expected positive relationship with OMG. These results indicate that a higher proportion of agricultural laborers in the rural work force may be associated with both in-migration and out-migration.

CASTE

A region with a high proportion of scheduled castes and tribes in the rural population tends to be generally backward in terms of agricultural development and other employment opportunities. Such regions lack adequate socio-economic infrastructure. Further, scheduled castes are often landless though the tribes may at most own a plot of agriculturally poor land. Both these groups work as agricultural laborers. As such they form a ready source of labor for demand that could be created within the region. Under such circumstances, we had expected to find a negative association between CASTE and IMG. The result seems to validate the argument, but the correlation coefficient is small.

Similarly, a negative association was expected between CASTE and OMG. As can be seen from Table 4.1, districts with a high value for CASTE have it because of a

greater proportion of scheduled tribes in their population. The fact that the tribes own a little land means that they will not migrate permanently to another place. The data show an almost negligible negative association between CASTE and OMG. Thus it seems that a high proportion deters in-migration; out-migration, however, is determined by other factors, so a district with a high value for CASTE may have either high or low values for OMG.

RAIN

Much of the performance of the Indian agriculture depends on rain. Therefore, the amount of rainfall a district receives is an important determinant of its agricultural prosperity. Surat, Broach and Kaira are some of the districts which receive good rainfall uniformly throughout the district. These are among the most agriculturally productive in the state. Low rainfall districts such as Panchmahals (where average rainfall is as high as 1536.4 mm but it is mainly due to the heavy rainfall in the forested areas) and Kutch are among the poorest. The above argument cannot be extended to forested and mountainous areas where heavy rainfall in fact keeps agricultural productivity low. Given the above argument, we expected rainfall to have a positive association with in-migration and a negative association with out-migration. The former relationship is confirmed by the data, but the latter is neither fully

confirmed nor fully refuted, since the correlation coefficient between RAIN and OMG is negligible.

CONC

This has been defined as the ratio of the share of area operated by the largest 10 per cent of the cultivators to the share of area operated by the smallest 10 per cent of the cultivators. The indicator is used to describe the land ownership pattern in a district. A high concentration ratio indicates a more unequal distribution of land. Large holding, specially in prosperous regions, need to use more labor. This can act as an important factor in attracting landless and unattached agricultural labor from the surrounding rural areas. So we expected a positive association between CONC and IMG. The result confirms the expected relationship.

It is difficult to specify the expected relationship between CONC and OMG. The opportunities generated by high CONC and consequently, large-size holdings may be first taken up by local labor, thus reducing the need for outmigration. However, if a high CONC also implies a high value of AGLAB, this will induce high outmigration. Thus, there are two opposite forces at work. The result seems to confirm this, since the correlation is negligible.

OUTPH

The nature of the relationship between OUTPH and migration depends on the kind of factors that bring about a particular level of output per hectare in a given district. Factors that make a higher output per hectare possible are good irrigation, use of fertilizers, use of new variety of seeds, greater cropping intensity and greater mechanization. A higher OUTPH can also be obtained by producing cash crops as the value of these is much higher than that of foodgrains. Taking all these factors into consideration, we expected OUTPH to have a positive relationship with IMG. The data show the expected relationship.

Once again it is difficult to specify the relationship of OUTPH with OMG. In general, one would expect a negative relation between the two variables. However, some of the factors leading to higher OUTPH also tend to lead to higher OMG. For example, greater mechanization tends to create surplus labor even as it increases land productivity. In sharp contrast to this, overcrowding of workers using backward techniques can also increase land productivity. Since this lowers output per worker, there is a pressure towards out-migration. In view of this, the small positive correlation between OUTPH and OMG is not totally unexpected.

FOODG

Foodgrain production is generally associated with subsistence agriculture and a low level of agricultural commercialization. The demand for labor in such an economy is limited as most of the labor comes from the farm household. As such we expected FOODG to have a negative relationship with in-migration and a positive relationship with out-migration. The former relationship is confirmed by the data but the latter relationship also comes out to be negative. Inspite of this result, it seems difficult to accept that a district with less than average FOODG will have higher than average OMG. It is worth noting that the negative correlation between FOODG and OMG is much smaller (in absolute value) than the negative correlation between FOODG and IMG.

SFARM

Small and marginal farmers rely on family labor to perform all their farm operations. As a matter of fact, as mentioned earlier, many among them have to sell their labor or engage in subsidiary employment. So in a district where small and marginal farm households are a large proportion of the farm households, there is not much demand for outside labor. Small and marginal farmers are also less likely to permanently migrate away from their land. We had therefore expected to find a negative relationship between SFARM and

both the dependent variables. This relationship exists in the case of OMG but IMG shows a positive relationship. We can speculate on why this could be happening. It is seen that some districts that are agriculturally prosperous generally show smaller size holdings. This is so because under good agricultural conditions, a smaller size farm can be economically viable. Even if these farmers do not use outside labor, the district because of its prosperity may generate agriculturally related employment opportunities that may act as an attracting force for in-migrants. Kaira is a good example. The average-size holding is small, but it still attracts many migrants maybe because of its extensive dairy activities.

Regression Analysis

Which of the above variables explain variations in in-migration into and out-migration from the districts of Gujarat? The result of the multiple regression analysis throws some light on this. The logarithmic function used provides factor elasticities and also eliminates the effect of differential sizes of the variables.

In-migration equation:

$$\begin{aligned} IMG = -7.21 &+ \underset{(3.38)}{.61\ AGLAB^{*}} + \underset{(3.21)}{.63\ RAIN^{*}} + \underset{(.72)}{.20\ CONC} + \\ &\underset{(2.09)}{.29\ OUTPH^{**}} - \underset{(-2.89)}{.27\ CASTE^{*}} + \underset{(2.70)}{.41\ DUMMY^{*}} \end{aligned}$$

$R^{2*} = .81$ $F(6,12) = 8.45$ $N = 19$

* = significant at 1 per cent level
** = significant at 5 per cent level
Values in brackets are t-statistics.
Dummy = 0 for net out-migration districts
= 1 for net in-migration districts

The selected variables explain 81 per cent of the variation in IMG. All the variables, with the exception of CONC, are statistically significant. AGLAB is the only variable not showing the expected relationship with IMG.

These results confirm our hypothesis that in-migration into the rural areas of a district from the rural areas of other districts depends positively on the agricultural (land) productivity in that district and negatively on its share of scheduled castes and tribal population. The elasticity of IMG with respect to OUTPH is .29, while it is .27 with respect to CASTE.

The variable AGLAB seems to be an important and significant determinant of in-migration. The coefficient is large. However, its relationship with IMG is not as expected. This positive relationship could be explained by the fact mentioned in the correlation analysis section that the greater porportion of agricultural labor in a district now may have been the result of past agricultural in-migration into the district. It is also quite possible that the stimulus for

past in-migration may still be present. Further, in-migration can occur inspite of a high AGLAB if the local labor will not perform certain kinds of activities.

Another variable that has a significant effect on in-migration is the amount of rainfall received by the district. The coefficient is as high as .63. It is empirically observed that in Gujarat, districts with adequate rainfall are agriculturally more productive than those with poor rainfall. It is obvious that this result should not be extended to the forested and mountainous regions where the rainfall is bound to be heavy, but the agricultural productivity poor.

The statistically significant DUMMY variable separates the net in-migration districts from the net out-migration districts. As expected its coefficient shows that gross in-migration is higher in net in-migration districts than in net out-migration districts and similarly gross out-migration is higher in net out-migration districts than in net in-migration districts.

Out-migration equation:

$$\begin{aligned} OMG = -5.46 &+ \underset{(3.57)}{.62\ AGLAB^{*}} + \underset{(2.76)}{.80\ FOODG^{*}} + \underset{(4.27)}{.52\ OUTPH^{*}} \\ &- \underset{(-3.43)}{.47\ SFARM^{*}} - \underset{(-2.02)}{.29\ DUMMY^{**}} \end{aligned}$$

$R^{2*} = .78$ $F(5,13) = 9.15$ $N = 19$

* = significant at 1 per cent level
** = significant at 5 per cent level
Dummy = 0 for net out-migration districts
= 1 for net in-migration districts

The above equation explains about 78 per cent of the variation in out-migration from the rural areas of a district to the rural areas of other districts. All the coefficients of the variables are significant at the 1 percent level with the exception of the DUMMY variable. OUTPH is the only variable that shows an unexpected relationship with OMG.

A higher proportion of agricultural laborers in the rural work force does act as a pressure for out-migration. The coefficient of AGLAB is .62. Also a larger proportion of small and marginal farmers in the total farm population seems to act as a deterrent to out-migration. FOODG turns out to be another important determinant of OMG. The elasticity of OMG with respect to it is .80. Interestingly, its relationship with OMG is as expected, in contrast with the result obtained from the correlation analysis and hence our hypothesis cannot be rejected.

Output per hectare is also found to be a significant determinant of out-migration. Its coefficient is as large as .62. However, its relationship with OMG is not as

expected. A higher output per hectare is taken as a proxy for general agricultural development in a district, and, as such, we expected it to be negatively related to out-migration. We have suggested an explanation for this observed relationship under the correlation analysis section. The DUMMY variable shows the expected relationship and consequently the same comments given earlier regarding it hold true here.

It is possible to provide an empirical-statistical explanation for the unexpected sign of the coefficients of AGLAB and OUTPH in the in-migration and out-migration equations, respectively.

The nineteen districts in Gujarat can be categorized into four groups. The classification was done as follows. First, migration was calculated as a percent of total rural work-force in the districts. This is presented in Table 4.2. Based on this, the four groups were then identified. Group I is comprised of high turn-over districts. These have above average in-migration and out-migration. Group II includes districts with low-turnover. Group III are districts with high out-migration but low in-migration, while Group IV has districts with high in-migration but low out-migration. This classification is given in Table 4.3.

There are six high turnover districts and six low turnover districts. This situation stands out in sharp

TABLE 4.2 : MIGRATION AS A PERCENT OF TOTAL RURAL WORK FORCE IN GUJARAT, 1971

District	In-migration as a percent of total rural work force	Out-migration as a percent of total rural work force
Jamnagar	4.1	3.9
Rajkot	6.1	5.3
Surendranagar	4.1	7.1
Bhavnagar	3.0	7.3
Amreli	6.0	7.6
Junagadh	5.3	3.1
Kutch	1.0	4.0
Banaskantha	4.1	4.0
Sabarkantha	4.4	2.7
Mehsana	3.4	5.4
Gandhinagar	9.1	5.2
Ahmedabad	8.0	6.4
Kaira	5.2	2.7
Panchmahals	1.1	2.7
Baroda	4.9	5.9
Broach	6.6	8.9
Surat	4.3	3.1
Bulsar	5.2	2.0
Dangs	5.8	1.0
All-Gujarat	4.8	4.5

SOURCE: Census of India, 1971, Gujarat State

TABLE 4.3 : CLASSIFICATION OF DISTRICTS INTO FOUR GROUPS

Group I	Group II	Group III	Group IV
Ahmedabad	Kutch	Surendranagar	Junagadh
Baroda	Banaskantha	Bhavnagar	Kaira
Gandhinagar	Jamnagar	Mehsana	Bulsar
Rajkot	Surat		Dangs
Broach	Panchmahals		
Amreli	Sabarkantha		

contrast to the general expected and observed pattern of migration, where we expect an area with a higher than average out-migration rate to have a lower than average in-migration rate and vice versa. There are of course, transition areas, such as medium-sized towns, in the case of rural-urban migration where we see such high turnover. However, the direction of the migratory flow is not from the origin to the transition area and from the transition area to the (former) origin. It is usually from some rural area into the town and out from the town to some city. The six high turnover districts do not exhibit this characteristic. The migration pattern that we see here is characterized by the fact that it occurs back and forth between rural areas. We find that a rural area which receives migrants from other rural areas, in turn sends out-migrants back to that area as well as to other rural areas. This makes it difficult to identify such an area either as a receiving or a sending area and hence the problem of searching for causal factors.

We can now see why regression analysis may give the wrong sign for the coefficients of some variables. Any independent variable which has a higher than average value in a high turnover district will be positively related to both in-migration and out-migration and this applies mutatis-mutandis, to a lower than average value of the independent variable. An inspection of the data shows that AGLAB and

OUTPH are higher than average in four out of the six high turnover districts. Further, these variables are lower than average in five of the six low turnover districts. This means that these two variables are likely to be positively related to both in-migration and out-migration.

In short, the data show that the high turnover districts are the ones with high land productivity and high proportion of landless laborers, while low turnover districts are the ones with low land productivity and a lower proportion of landless laborers. For this reason, we can expect the regression equations to show that AGLAB and OUTPH are positively related with in-migration as well as with out-migration.

In this chapter, we have analyzed the inter-district, rural-to-rural migration in Gujarat. Briefly summarizing the results of the analysis, we find that factors responsible for in-migration are the proportion of agricultural laborers in the rural work force, amount of rainfall, output per hectare, and the proportion of scheduled castes and tribes in the population. In the case of out-migration, two of these, proportion of agricultural laborers in the rural work force and output per hectare are the same while the other two explanatory variables are the proportion of land devoted to foodgrains and the proportion of small and marginal farm households to the total rural households. The results

suggest that

a. the proportion of agricultural laborers in the rural work force and the output per hectare act as both push and pull factors for rural-to-rural migration.

b. a good rainfall is positively related to in-migration into the district.

c. the proportion of scheduled castes and tribes in the rural population is inversely related to in-migration.

d. a higher proportion of foodgrains grown in the district is associated with an increase in out-migration from the district.

e. out-migration declines with an increase in the proportion of small and marginal farm households in the rural households.

The other major finding of the analysis is that the rural areas of the nineteen districts of Gujarat can be categorized into four groups according to the rural-to-rural migration turnover - districts with high turnover, districts with low turnover, districts with high out-migration but low in-migration and finally districts with high in-migration but low out-migration.

Conclusion:

All these findings can be useful in suggesting a possible direction for future policies regarding rural development in Gujarat. It should be pointed out that we are

in no way capable of suggesting concrete policies on the basis of our analysis so far. Our findings at best are evidence supporting certain relationships and patterns of development. The policy choices can be made only after careful research into these relationships and patterns. In the next chapter we shall outline the possible directions for further research.

CHAPTER V

DIRECTIONS FOR FURTHER RESEARCH

In this chapter we shall focus on the implications of our analysis for development strategies for rural Gujarat.

At the very outset, we should make it clear that our analysis can only be the first step in formulating development policies and that we shall have to restrict ourselves to outlining the direction for further research. It is hoped that this further research will form the basis for formulating policy recommendations.

Implications of the Findings for Future Research:

We shall deal with three questions in this section. First, we shall discuss what is meant by developing rural areas. We shall then proceed to show how some of our findings relate either directly or indirectly to such development. Finally, we shall suggest further research that would be required to make policy decisions to bring about this development.

What is meant by rural development? This topic abounds with literature. Briefly, rural development may be defined as that process that transforms the rural economy through the adoption of modern production techniques and

the development of the necessary institutional arrangements required for an increase in productivity. (Schickele in Weitz, 1971, p.58) More and more policy-makers in the developing countries are realizing that increased over-all productivity per se is not a sufficient condition to improve the quality of life of the majority of the people who have very limited access to income-earning opportunities. In India, about 50 per cent of all the rural households fall below the Dandekar-Rath poverty line*, while some 20 per cent are on the verge of it. (Mellor, 1976, p.76) Almost all landless agricultural laborers and half of the small farmers owning between 1 and 5 acres of land fall in this category. In terms of the caste structure, most of the members of the scheduled castes and tribes also fall below this line. (ISAE & IIMA, 1974, p.180) As we pointed out earlier, this group has inadequate access to income-earning opportunities in the rural areas.

Given these conditions, it is not surprising that India is interested in employment creating strategies for the rural poor. The question now is: given this orientation, in what way are our findings related to such a strategy?

Our analysis has shown that agricultural laborers are

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* Dandekar-Rath (Mellor, 1976, p.76) have set the poverty line at Rs. 20 per person per month according to 1960-61 prices, on the grounds that persons below this income level get inadequate calories to maintain normal health and activity.

a mobile group over short distances. This suggests that their (employment) problems should not be tackled at the district level but on a regional level. Region in this context is defined as three or four neighboring districts among which labor mobility is high. As a consequence of this regional nature of labor mobility, any attempt to provide more employment in the rural areas of one district will result in an inflow of labor from rural areas of surrounding districts. Thus the unemployment level in the first district may remain unchanged, although the sending area and the migrants may have benefitted somewhat. More research is needed in identifying such 'migration' regions, understanding their dynamics of development and the interrelations within each region of various socio-economic factors.

One strategy suggested by Desai and Schulter (ISAE & IIMA, 1974, p.143-152) to generate additional employment in the rural sector is to encourage the production of non-foodgrain crops like sugarcane, oilseed and tobacco. Based on their study (in Surat district) of sugarcane and groundnut cultivation, they have shown that non-foodgrain crops are much more labor intensive. They argue that the demand for non-foodgrain crops will continue to rise along with income because of high income elasticities for the products derived from these crops. The other advantage of growing these crops is that they can be grown in irrigated as well

as unirrigated areas. The other factor Desai and Schulter consider in their study is the potential of these crops for creating agro-related industries for processing agricultural produce.

The labor requirement aspect of this strategy is supported by our analysis which shows that labor moving out of predominantly foodgrain growing areas can meet the demand created by this strategy. Adopting this strategy solely on the basis of our analysis would no doubt be rash, since the issue is a very sensitive one. The choice is between two necessities — food and employment. As a result, this emerges as an important issue to focus more research on. Can we identify regions that could possibly benefit from this strategy? Are there possibilities of adopting such a strategy without reducing the output of foodgrains through pushing intensive cultivation of foodgrains? Modernizing foodgrain production need not imply displacement of labor. Agricultural modernization in its early stages increases rather than decreases labor requirements. Better and more timely tillage, application of fertilizers, weeding, efficient water control for irrigation, diversification of crops and double cropping all require more labor.

Another finding of our analysis that has relevance to rural development is that a high proportion of scheduled castes and tribes in a rural area deters in-migration. This

coupled with the observation that generally the districts with a high proportion of these groups also tend to be low turnover districts suggests that rural areas of these districts may be economically stagnant. This is not always the case because there are exceptions such as Baroda, Broach and Bulsar. We suggest that more research needs to be focussed on those areas that may be stagnant. We shall discuss this later.

The empirical finding regarding the magnitude of rural-to-rural migration which makes it possible to group the districts of Gujarat into four categories (Table 4.3) provides some interesting implications for a development strategy. We are concerned with the high out-migration districts (Group III) and the low turnover districts (Group I) as these can be identified as relatively poor districts.

The three high out-migration districts (Surendranagar, Mehsana and Bhavnagar) are centrally located. Further, their high rates of out-migration suggest a tradition of sending migrants to nearby rural areas of prosperous districts. We cannot use this observation to formulate a development strategy for these districts but we can indicate how further research can usefully exploit this finding to come up with some policy recommendations.

For the next step in research we can consider at least

two alternative strategies — one of balanced regional development and the other of developing regional growth centers. The former strategy emphasizes the need to assist the areas which have remained backward. The latter strategy emphasizes economies of scales in investment and the need to build up a substantial infrastructure before any development can take place. Advocates of regional growth center strategy assert that benefits from such a strategy diffuse across the region, so that, there is indeed a 'balanced' distribution of economic opportunity. Thus, the objectives of both the strategies are the same. The final results may differ.

This conflict of choosing between the two strategies may not be severe for the high out-migration districts. It is clear that the benefits of a balanced regional development strategy will be low for backward areas until such time as the socio-economic infrastructure has been adequately developed. On the other hand, the benefits of the regional growth center located in a nearby relatively better-off district will be high and quick in coming since it already has the necessary infrastructure. Consequently, at least the out-migrants from the poorer districts will be able to participate in these benefits. The high out-migration may improve the condition of the remaining population by improving the land-labor ratio.

The discussion so far has been a theoretical one.

Choosing a viable growth center demands a rigorous analysis of the regions under consideration. We also need to know how the effects of various activities will spread within the region. More important still, we also need to give careful consideration to the districts with high out-migration. What can be done to help build up their socio-economic infrastructure so that people who stay back are not discriminated against?

The situation with regard to the six low turnover districts (Jamnagar, Kutch, Banaskantha, Sabarkantha, Surat and Panchmahal) is different. This is because the rural population of these districts does not show a tradition of permanent out-migration. This is mainly because these districts, with the exception of Jamnagar, have relatively large proportions of scheduled tribe people in their rural populations. The tribes people are quite immobile as pointed out earlier. Under such conditions, we cannot develop a nearby center and hope that the tribal people will migrate and benefit from it. As such, special attention may have to be given to each of these districts. This is already recognized by the Government, which has adopted the development of tribal regions as a policy in the Fifth Five-Year Plan. In accordance with this policy, the state Government has formulated a Tribal Area Sub-Plan as part of its Fifth Plan. So far four project areas have been identified. These are

Panchmahal, Broach, Surat and Bulsar (Government of Gujarat, Development Programme 1976-77, 1976, p.88).

A basic question remains unanswered. Is rural-to-rural migration desirable? It is generally believed that for the process of modernization to occur, there needs to be a transfer of capital as well as human resources from the low productivity agricultural sector to the high productivity industrial sector. This argument suggests that among other processes, rural-to-rural migration is important in bringing about this transfer.

From the above argument it would appear that rural-to-rural migration is detrimental to the socio-economic transformation of society. Recent studies however, have shown that the urban labor market in developing countries is highly segmented (Peattie, 1974) and most of these rural-to-urban migrants are permanently employed in the 'informal' labor market (Lund, 1976; Aklilu and Harris, 1977). These activities cannot be classified as 'modern' or 'highly' productive. Consequently, rural-to-urban migration in developing countries may not be a 'modernizing agent' most of the time. Therefore, the theoretical argument in favor of rural-to-urban migration seems a little weak. In this case, rural-to-rural migration may not be detrimental to socio-economic transformation.

Hence we suggest further research to compare the advantages and disadvantages — for the migrants as well as for the economies of the 'sending' and 'receiving' areas - of the two alternative flows of migration.

Conclusion:

In this chapter we have considered the implications of our analysis for future research which can in turn help us to formulate relevant policies for developing rural areas of Gujarat. We feel that whatever future research we undertake with a view to solve the employment problems, it would be more meaningful to tackle the problem at the regional level rather than at the district level, given the high labor mobility across three or four districts.

Although our findings support the Desai and Schulter proposal of changing the cropping pattern from foodgrain to non-foodgrain because of its employment creating potential, we pointed out that this may intensify food shortages. We suggest that much more work needs to be done in identifying the extent to which such a strategy may be effective without reducing foodgrain production.

In our analysis we have identified high out-migration districts and low turnover districts. To be able to formulate development strategies for such districts, we need to understand the factors causing these patterns. We would

need more information also on the pattern of interaction these districts have with the neighboring districts.

Apart from studying the poorer regions, it is just as important to study the more prosperous rural areas. What kind of interactions do these have with the poorer regions? Can some of these be chosen as viable growth centers to bring about greater economic opportunities in the neighboring districts?

Finally, we feel that more research is necessary to compare the relative merits of rural-to-rural and rural-to-urban migration. This would help us in answering what the policy towards rural-to-rural migration should be.

CHAPTER VI

SUMMARY AND CONCLUSIONS OF THE STUDY

In this study, we have attempted to analyze rural-to-rural migration, a relatively unexplored line of investigation. The setting of the study is Gujarat, a state in western India.

Our discussion in Chapter Three has shown that, in general, male migration in Gujarat (1951-61) follows the same pattern as in the rest of the country. Rural-to-rural migration is predominant within the state. Of all the intra-state migration in Gujarat, 46 per cent was from rural to other rural areas, while only 29 per cent was from rural to urban areas. It is observed that rural-to-rural migration is over shorter distances than rural-to-urban migration. In this study we have attempted to understnad some of the factors responsible for such high inter-rural male migration.

We have used two sets of data for our analysis. The data on rural-to-rural migration is taken from the 1971 Census of Gujarat and it refers to the lifetime migration in the districts of Gujarat. The data on agricultural laborers, rainfall, pattern of land ownership, scheduled castes and tribes, output per hectare, area under cultivation of food-grains, and small and marginal farm households are also taken from the various publications of Census of Gujarat and India, 1970-71.

The analysis of rural-to-rural male migration was done by the multiple regression technique. The in-migration equation was estimated in the logarithmic form with the proportion of agricultural labor in the total rural work force, amount of rainfall, land concentration, output per hectare, and proportion of scheduled castes and tribes in the rural population as the independent variables.

The out-migration equation was estimated similarly, using the following independent variables: proportion of agricultural labor in the total rural work force, output per hectare, proportion of gross cropped area devoted to foodgrains, and small and marginal farm households as a percentage of total rural households.

The findings of this analysis are as follows:

a. The proportion of laborers in the rural work force and and the output per hectare act as both push and pull factors for rural-to-rural migration.
b. A good rainfall is positively related to in-migration in the district.
c. The proportion of scheduled castes and tribes in the rural population is inversely related to in-migration.
d. A higher percentage of foodgrains grown in a district is associated with an increase in out-migration from that district.
e. Out-migration declines with an increase in the proportion of small and marginal farm households in the rural households.

Observation of the actual rural-to-rural, inter-district flows made it possible to categorize the districts into four groups: districts with high turnover, districts with low turnover, districts with high out-migration but low in-migration, and finally districts with high in-migration but low out-migration.

Based on our analysis, we suggest that further research needs to be done in the following areas in order to formulate meaningful policies for rural development of Gujarat:

a. Since a cropping pattern dominated by cash crops creates employment potential, we suggest that much more work needs to be done in identifying the extent to which such a strategy may be effective without reducing foodgrains production.

b. In our analysis we have identified high out-migration districts and low turnover districts. To be able to formulate development strategies for such districts, we need to understand the factors causing these patterns. We would need more information also on the pattern of interaction these districts have with the neighboring districts.

c. Apart from studying the poorer regions, it is just as important to study the more prosperous rural areas. Can some of these be chosen as viable growth centers to bring about greater economic opportunities in the

neighboring districts?

d. Finally, we feel that more research is necessary to compare the relative merits of rural-to-rural and rural-to-urban migration. This would help us in answering what the policy towards rural-to-rural migration should be.

We feel that whatever future research we undertake with a view to solve the employment problems, it would be more meaningful to tackle the problem at the regional level rather than at the district level, given the high labor mobility across three or four districts.

APPENDIX A

NATURE OF DATA

The migration data used for this study is taken from the 1971 Census of Gujarat state. As the full migration count is not yet available, this study is based on the 1 per cent sample count. In the 1971 Census, migration data were collected with reference to last place of residence, unlike in the earlier censuses where they were collected in reference to the migrant's place of birth. A migrant is therefore defined as a person whose last place of residence is different from the place where he is enumerated. The migrant's last place of residence is classified according to its rural/urban characteristic and is further cross-classified with the rural/urban characteristic of the place of enumeration. Besides this breakdown, the data are also categorized according to the migrant's duration of residence at the place of enumeration (period not stated, less than one year, between one and four years, between five and nine years, between ten and nineteen years, and more than twenty years). As a result of this information, it was possible to calculate for each district, the male in-migrants into its rural areas from the rural areas of all other districts and the out-migrants from it to the rural areas of other districts. These were calculated first according to each period of duration. Then, summing these across all the

periods, we got the volume of lifetime rural-to-rural inmigration into and out-migration from each district. The difference between the two gave the net migration for the district.

The second set of data used for the present analysis pertains to a selected number of variables that reflect the socio-economic characteristics of the districts. These data were also taken from the 1971 Census of Gujarat. These indicators were used as the independent variables to explain the migration under study. The particular variables were selected on the basis of data availability and therefore some important variables had to be completely ignored in the analysis. As such, we have some hesitation in presenting the present analysis as definitive.

The data used for this study have no doubt many limitations. They are very highly aggregated, and much of the vital information regarding the migrants is not available. Many studies have shown that the social, economic, and personal characteristics and circumstances of the migrants have a decisive role to play in his or her decision to move to another place. Vital information, such as the age and the education of the migrant, his or her socio-economic status, his or her decision regarding the destination and the duration of migration, his or her reasons and motives for migrating, is all unknown in the case of the rural-to-rual migrant. The study therefore has to rely on the

aggregated socio-economic characteristics of the rural areas of the districts to explain factors that attract migrants and those that may be responsible for pushing out migrants. While such an analysis is useful for understanding the rural-to-rural migration to a certain extent, it cannot throw light on many important issues.

The data used have other limitations also. They can often result in simultaneity bias in the estimate of the migration elasticities, since migration that has occurred over a long period of time is likely to have influenced the independent variables. For example, it may be difficult to isolate poor man:land ratio as a cause of current migration, if actually past migration has had the effect of lowering this ratio. Besides this problem, there is also the question of relating migration that has occurred over a long period of time to varibles that refer to a given point in time. In the present study, rural-to-rural male migration under consideration is lifetime migration, while the variables used to explain this migration relate to the year1971. In spite of these shortcomings, we have made an initial attempt at understanding rural-to-rural migration using thesedata.

APPENDIX B

THE SETTING: INTRODUCTION TO GUJARAT

Gujarat is a state in Western India. It is one of the smaller states with roughly 6 per cent of the area of the Indian Union and about 5 per cent of its population. This state today has nineteen districts and 185 talukas, with a total land area of 187,000 square kilometres and a population of 27 million. About 28 per cent of the state's population lives in the urban areas.

Gujarat is one of the more industrialized states in India, following West Bengal and Maharashtra. It has a well-developed cotton textile industry centred in Ahmedabad, the largest city in the state. Recently, petroleum has been discovered in the coastal areas of the state. This has led to the establishment of a three-million tonne capacity public sector refinery with an associated petro-chemical complex at Baroda, the second largest city in the state. The agricultural potential of the state is considered limited relative to its industrial potential. Nonetheless, it forms a vital sector of the economy.

Physical Configuration:

A look at the geography of Gujarat shows that it can be divided into five physiographic units: the coastal lowlands

of Gujarat and the Rann (desert) in the north-west; the plains of Gujarat; the plateau of Saurashtra in the south-west; the piedmont zone; and the highlands comprised of hills and ridges.

The coastal lowlands: The entire coast of Gujarat in the west is characterized by tidal flats. These are submerged under water at high tide and are very poorly drained even when above the water level. As such, the tidal flats are saline wastes and are unsuitable for cultivation. They account for over 100 square kilometres of land.

The Rann of Kutch and the Little Rann: The entire north-west of Gujarat is a desert--saline wastes that have the same origin as the coastal marshes. The total area is about 11,000 square kilometres. The desert is dry during the non-rainy season, while in monsoons it is not effectively drained, which results in water logging. The central area of this region is hilly.

The Plains of Gujarat: These lie in the interior part of the state between the marshy coastal zone in the west, the plateau in the south-west and the hilly regions along the eastern boundary of the state. The plains are drained by the rivers Sabarmati, Mahi, Narmada, Tapi, and their tributaries. The soil is deep alluvium and is very fertile.

The Plateau of Saurashtra in south-west Gujarat: The plateau is the remnant of the extensive sheet of lava that once covered most of western India. The center of the plateau rises to form hills. The famous Girnar hills, the home of the Gir lion, are part of this range.

The Piedmont Zone: These comprise the lower areas of the hill slopes. They lie between the highlands and the plains in a narrow strip. The slope does not allow any soil to be formed and retained here, and the result is a sandy and gravelly thin soil. It is good only for growing a certain variety of millet. Many of the backward tribes live in this region.

The Highlands: These are found in the central part of the desert, in the central part of the plateau in the south-west and along the eastern boundary of the state. The eastern highlands are more rugged and formidable.

Rainfall:

Gujarat receives much of the rainfall from the south-west monsoons during the period between June and September. November to May is the dry period. The amount of rainfall varies considerably from one part of the state to the other. The sourthernmost part--a part of Bulsar district--gets as much as 2000 mm. of rainfall. It begins to gradually decrease in the north. The whole of south-west receives less than

500 mm. with the exception of the hills, which receive more than 700 mm. The desert is semi-arid and much of it receives less than 400 mm. of rainfall. In the plains, the rainfall decreases northward, with Baroda receiving 910 mm., Ahmedabad 730 mm., and Bhavnagar 500 mm.

Land Use and Agriculture:

About 52 per cent of the area of the state is under cultivation. Unsuitable conditions in some parts and rocky terrain with thin or no soil in others have limited the area suitable for cultivation. The coastal zone and the entire desert is agriculturally unproductive. Of the area under crops, about 60 per cent is devoted to food crops, producing roughly 65 per cent of the state's requirements for foodgrains.

Gujarat's agricultural productivity is low. The yields are poor and with the exception of cotton, groundnuts and tobacco, they do not even approach the low level of average yield for the country. This is the result of various factors, such as poor soil, inadequate rainfall, frequent droughts and floods, and undeveloped irrigation facilities. In 1970, only 12 per cent of the total cultivated area was irrigated as against the national average of 22 per cent. Gujarat's agriculture is unproportionately dominated by cash crops. It produces 25 per cent of the cotton, 14 per cent of the

groundnuts, and 16 per cent of the tobacco produced in the country. These crops claim the best agricultural land.

Most of the districts have between 60 to 70 per cent of their area under cultivation. The only exception are Kutch, Dangs, Junagadh, Panchmahals, and Broach. Kutch is part of the desert. Its thin soil can support only grass. As such, sheep grazing is the important activity. Central Gujarat is quite fertile and most districts in this region have more than two-thirds of their land under cultivation. Kaira, Baroda, Broach, and Surat districts which lie in the plains have more than three-fourths of their land under cultivation and are in fact the major contributors to the agricultural production of the state. The plateau of Saurashtra in the south-west, where the soil is thin and the rainfall scanty, is mainly pasture land.

About 9 per cent of the land in Gujarat is under forests. These are mainly in the hilly regions of the state. A large part of the forest which is economically exploitable is distributed in the districts of Dangs, Panchmahals, Broach, Surat, Bulsar, Junagadh, Sabarkantha, and Banaskantha.

It is officially estimated that there is still some cultivable land lying waste which can be reclaimed for cultivation. Such land is estimated at over 0.5 million acres in Kutch. Mehsana, Surendranagar, Jamnagar,

Panchmahals, and Surat have each more than 100,000 acres. Much of this land is believed by experts to be really unsuitable for cultivation under present conditions. It would require huge resources to bring such land under cultivation in the near future.

Industries:

On the basis of the number of registered factories and the total number of labor hours worked, Gujarat stands third among the Indian states following West Bengal and Maharashtra. In 1965, it possessed more than 8 per cent of the total registered industrial units in the country and accounted for 9 per cent of the industrial employment in the country. It is the biggest producer of salt and the second biggest producer of textiles in India. Other major industries of the state are general and electrical engineering, heavy chemicals, vegetable oil, pharmaceuticals, cement, ceramics, fertilizers, and petrochemicals. As for petroleum, it is the only other state besides Assam with developed oil-fields.

The distributional pattern of industries is characterized by excessive concentration in certain areas and a consequent development of industrial clusters. If all factories are considered, four important clusters, centered in and around Ahmedabad, Surat, Baroda, and Kaira,

emerge in this order of importance. These clusters form a narrow industrial belt along central Gujarat. Another such belt, although much less important, covers the districts of Bhavnagar, Surendranagar, Rajkot, and Jamnagar.

APPENDIX C

TABLE C.1 : MALE RURAL-TO-RURAL INTER-DISTRICT MIGRATION FLOWS, GUJARAT, 1971 (in '00s)

FROM \ TO	Jamnagar	Rajkot	Surendranagar	Bhavnagar	Amreli	Junagadh	Kutch	Banaskantha	Sabarkantha	Mehsana	Gandhinagar
Jamnagar	--	30	5	3	2	27	4	1	3	0	1
Rajkot	48	--	18	10	24	50	5	0	0	0	1
Surendranagar	1	31	--	7	2	12	1	1	1	11	2
Bhavnagar	13	43	5	--	51	18	0	1	2	1	0
Amreli	0	34	1	41	--	64	0	2	1	2	0
Junagadh	28	37	2	8	32	--	2	1	2	1	0
Kutch	2	7	5	1	3	11	--	5	23	6	1
Banaskantha	0	1	5	0	1	3	2	--	14	77	14
Sabarkantha	0	4	0	0	5	0	4	7	--	12	5
Mehsana	0	0	10	0	0	7	3	13	33	--	23
Gandhinagar	0	0	3	0	0	0	0	2	2	11	--
Ahmedabad	0	8	23	15	4	3	0	10	3	34	14
Kaira	0	1	6	2	0	0	1	1	14	2	6
Panchmahals	1	2	0	0	0	0	0	2	21	4	0
Baroda	1	1	1	2	2	0	0	0	6	2	2
Broach	0	0	0	2	0	0	0	0	5	1	0
Surat	0	0	0	1	1	0	1	0	1	0	0
Bulsar	0	0	0	0	1	4	0	0	0	0	0
Dangs	0	0	0	0	0	0	0	0	0	0	0
Total	94	198	84	93	125	199	23	146	140	166	47

(continued on next page)

TABLE C.1 (CONTINUED)

FROM \ TO	Ahmedabad	Kaira	Panchmahals	Baroda	Broach	Surat	Bulsar	Dangs	Total
Jamnagar	4	3	0	0	1	4	2	0	90
Rajkot	5	4	0	0	0	4	3	0	172
Surendranagar	44	20	3	3	1	1	4	0	145
Bhavnagar	17	16	0	5	17	25	11	1	226
Amreli	0	2	0	1	0	7	2	0	157
Junagadh	1	1	0	0	0	0	0	0	115
Kutch	6	9	0	3	2	1	3	0	88
Banaskantha	15	7	1	1	1	0	3	0	145
Sabarkantha	20	22	2	2	2	0	2	0	87
Mehsana	53	9	2	3	4	2	2	0	264
Gandhinagar	7	3	0	0	0	0	0	0	27
Ahmedabad	--	60	2	3	1	3	3	0	191
Kaira	44	--	9	40	13	5	17	0	161
Panchmahals	7	49	--	63	13	2	6	0	170
Baroda	7	52	39	--	100	10	20	1	277
Broach	2	20	4	92	--	80	93	1	300
Surat	4	6	5	5	63	--	52	5	144
Bulsar	2	5	0	10	3	50	--	11	86
Dangs	0	0	0	0	0	3	1	--	4
Total	238	306	68	232	222	200	226	23	2848

SOURCE: Census of India, 1971, Gujarat State

TABLE C.2 : RURAL-TO-RURAL, INTER-DISTRICT LIFETIME MIGRATION IN GUJARAT, 1971

District	In-migrants	Out-migrants	Net migrants
Jamnagar	9,400	9,000	+ 400
Rajkot	19,800	17,200	+ 2,600
Surendranagar	8,400	14,500	- 6,100
Bhavnagar	9,300	22,600	- 13,300
Amreli	12,500	15,700	- 3,200
Junagadh	19,900	11,500	+ 8,400
Kutch	2,300	8,800	- 6,500
Banaskantha	14,600	14,500	+ 100
Sabarkantha	14,000	8,700	+ 5,300
Mehsana	16,600	26,400	- 9,800
Gandhinagar	4,700	2,700	+ 2,000
Ahmedabad	23,800	19,100	+ 4,700
Kaira	30,600	16,100	+ 14,500
Panchmahals	6,800	17,000	- 10,200
Baroda	23,200	27,700	- 4,500
Broach	22,200	30,000	- 7,800
Surat	20,000	14,400	+ 5,600
Bulsar	22,600	8,600	+ 14,000
Dangs	2,300	400	+ 1,900

SOURCE: Census of India, 1971, Gujarat State

TABLE C.3 : GROSS VALUE OF OUTPUT PER HECTARE OF CULTIVATED LAND, GUJARAT, 1971

District	Gross Value of Output per hectare (Rupees)
Jamnagar	922.70
Rajkot	1150.19
Surendranagar	780.38
Bhavnagar	818.44
Amreli	1184.59
Junagadh	2188.28
Kutch	557.44
Banaskantha	425.55
Sabarkantha	1436.42
Mehsana	929.96
Gandhinagar	872.89
Ahmedabad	836.90
Kaira	1749.27
Panchmahals	924.90
Baroda	1231.15
Broach	1142.31
Surat	796.14
Bulsar	643.65
Dangs	106.59
All-Gujarat	984.06

SOURCE: Agricultural Census of Gujarat, 1970-71; Agricultural Situation in India, 1970-71; and Brief on Indian Agriculture, 1974.

TABLE C.4 : TOTAL RURAL POPULATION AND TOTAL RURAL WORK FORCE, GUJARAT, 1971

District	Total Rural Population ('000s)	Total Rural Work Force ('000s)
Jamnagar	719	229
Rajkot	1001	323
Surendranagar	617	203
Bhavnagar	956	309
Amreli	680	208
Junagadh	1171	375
Kutch	635	221
Banaskantha	1146	361
Sabarkantha	1084	320
Mehsana	1704	487
Gandhinagar	177	52
Ahmedabad	964	298
Kaira	1962	588
Panchmahals	1642	631
Baroda	1377	471
Broach	917	339
Surendranagar	1184	469
Bulsar	1172	435
Dangs	94	39

SOURCE: Census of India, 1971, Gujarat State

TABLE C.5 : PERCENT DISTRIBUTION OF URBAN AND RURAL POPULATION, GUJARAT, 1971

District	Population ('000s)	Percent rural	Percent urban
Jamnagar	1111	65	35
Rajkot	1624	62	38
Surendranagar	845	73	27
Bhavnagar	1405	68	32
Amreli	849	80	20
Junagadh	1657	71	29
Kutch	850	75	25
Banaskantha	1265	90	10
Sabarkantha	1188	91	9
Mehsana	2092	81	19
Gandhinagar	201	88	12
Ahmedabad	2910	33	67
Kaira	2451	80	20
Panchmahals	1849	89	11
Baroda	1980	69	31
Broach	1110	83	17
Surat	1787	66	34
Bulsar	1429	82	18
Dangs	94	100	0

SOURCE: Census of India, 1971, Gujarat State

TABLE C.6 : DISTRIBUTION OF SCHEDULED CASTES AND TRIBES IN THE RURAL POPULATION OF GUJARAT, 1971

No.	District	Percent of S.T.&S.C. in the population
1.	Jamnagar	7.1
2.	Rajkot	7.5
3.	Surendranagar	12.1
4.	Bhavnagar	4.7
5.	Amreli	8.2
6.	Junagadh	9.3
7.	Kutch	15.3
8.	Banaskantha	16.6
9.	Sabarkantha	25.3
10.	Mehsana	9.4
11.	Gandhinagar	6.5
12.	Ahmedabad	11.5
13.	Kaira	7.4
14.	Panchmahals	45.5
15.	Baroda	39.2
16.	Broach	55.3
17.	Surat	68.0
18.	Bulsar	63.8
19.	Dangs	--

TABLE C.7 : PROPORTION OF AGRICULTURAL LABORERS AND CULTIVATORS IN THE RURAL WORK FORCE, GUJARAT, 1971

District	Proportion of laborers in total rural work force	Proportion of cultivators in total rural work force
Jamnagar	0.638	0.160
Rajkot	0.613	0.194
Surendranagar	0.488	0.324
Bhavnagar	0.518	0.266
Amreli	0.587	0.238
Junagadh	0.592	0.233
Kutch	0.493	0.277
Banaskantha	0.681	0.170
Sabarkantha	0.641	0.180
Mehsana	0.526	0.278
Gandhinagar	0.404	0.288
Ahmedabad	0.423	0.369
Kaira	0.568	0.265
Panchmahals	0.849	0.077
Baroda	0.435	0.418
Broach	0.354	0.529
Surat	0.382	0.443
Bulsar	0.462	0.329
Dangs	0.692	0.201
All-Gujarat	0.692	0.276

SOURCE: Agricultural Census of India, 1971

TABLE C.8 : CONSUMPTION OF FERTILIZERS AND AREA IRRIGATED, GUJARAT, 1971

District	Fertilizers (in Kilograms per hectare)	Percentage of cultivated land under irrigation
Jamnagar	21.8	8.1
Rajkot	32.6	14.0
Surendranagar	3.6	6.3
Bhavnagar	18.9	8.8
Amreli	36.5	8.8
Junagadh	29.7	17.3
Kutch	2.5	6.6
Banaskantha	3.4	10.1
Sabarkantha	11.4	12.0
Mehsana	11.3	21.4
Gandhinagar	1.4	16.7
Ahmedabad	11.5	11.5
Kaira	36.7	16.5
Panchmahals	5.7	1.8
Baroda	26.0	9.6
Broach	12.3	5.7
Surat	19.1	12.8
Bulsar	19.5	5.6
Dangs	1.0	0.2
All-Gujarat	16.0	10.2

SOURCE: FERTILISER STATISTICS, 1972 and AGRICULTURAL CENSUS OF GUJARAT, 1970-71.

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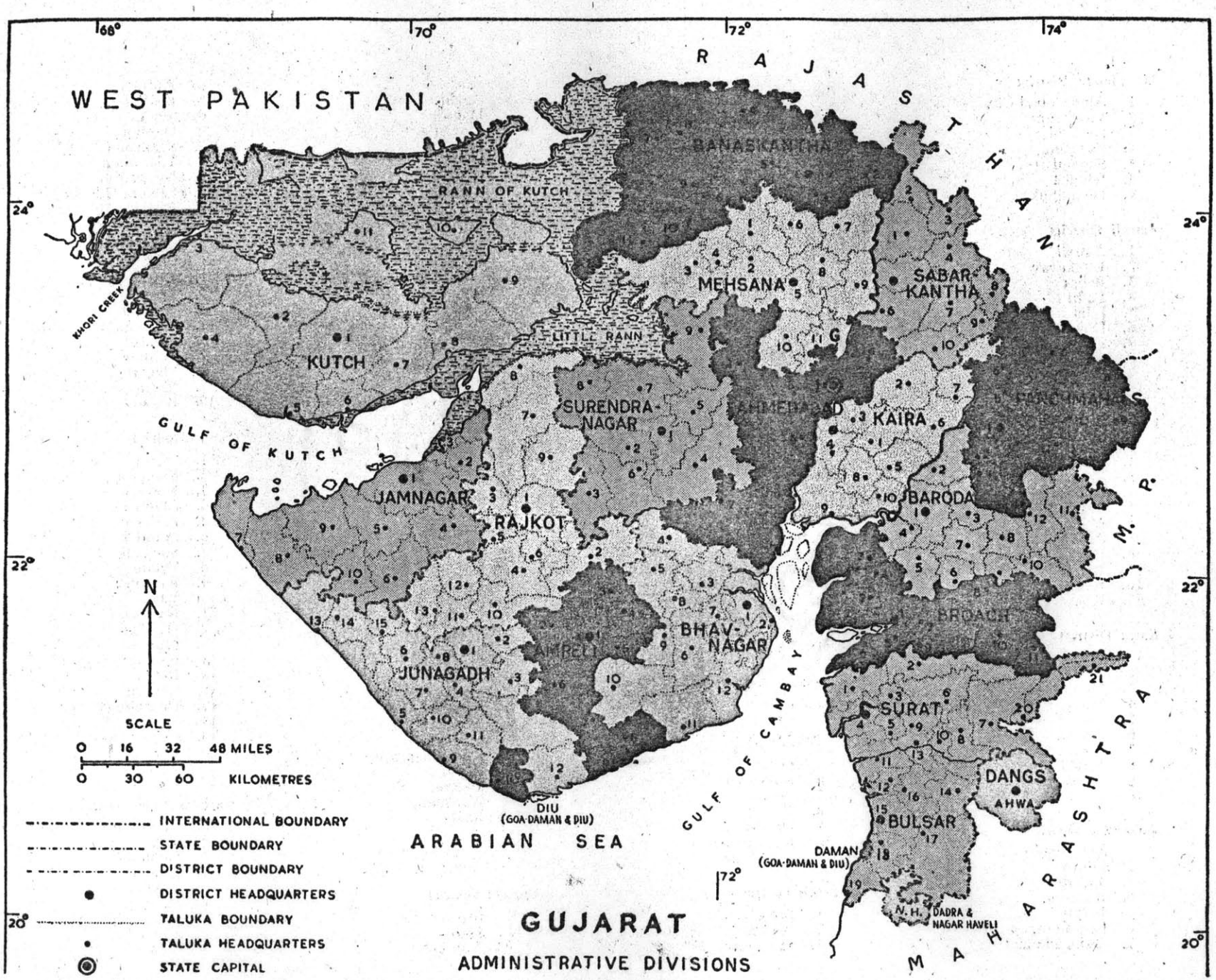

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